

JOURNAL  
*of the*  
American Veterinary Medical  
Association

FORMERLY

AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n.)

EDITED AND PUBLISHED FOR

The American Veterinary Medical Association



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(Original Official Organ U. S. Vet. Med. Ass'n.)

H. Preston Hoskins, Secretary-Editor, 716 Book Building, Detroit: Mich.

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M. JACOB, Treasurer, Knoxville, Tenn.

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September, 1928

No. 5

**MINNEAPOLIS BREAKS RECORD**

The 1928 meeting of the American Veterinary Medical Association, held in Minneapolis, is now a part of veterinary history in this country. As generally predicted, the convention broke all records for attendance. Dr. J. P. Foster, chairman of the Subcommittee on Registration, reported that over 1400 registered during the week and it will be surprising if the final check-up does not show close to 1500, or even more. In addition to establishing a new attendance figure, Minneapolis won other laurels. The entertainment provided for the ladies, the appointments for the meeting, the banquet and the clinic all set new marks for future convention cities to "shoot at."

The members of the Local Committee on Arrangements were the recipients of showers of well-deserved praise. The chairmen and members of all subcommittees were "on their toes" the whole week and the carefully laid plans of the past year came to full fruition with clock-like precision. Those who have never had the pleasure of planning the details of an A. V. M. A. convention cannot appreciate how much hard work is essential for the success of one of our annual conclaves. Those who have been on the inside can readily do so.

The official program was followed with practically no deviation. Honorable Theodore Christianson, governor of Minnesota, was there in person and delivered a stirring address of welcome.

His statement that he was heartily in favor of continuing the work of eradicating tuberculosis from the cattle of Minnesota was received with a great outburst of applause. The address of President Hilty, published in this issue of the JOURNAL, recounted the accomplishments of the past year and contained a number of recommendations to the Association. In order to appreciate this address it should be read in full.

The Executive Board reported the completion of the big job of studying a long list of proposed changes in the Constitution and By-Laws. These were taken up and disposed of at the business session Tuesday afternoon. This was accomplished without



THE A. V. M. A. CLINIC AT UNIVERSITY FARM  
Dr. C. P. Fitch in the role of anesthetist.

any serious objections being offered to the recommendations of the Executive Board. It was agreed that the amendments adopted should not go into effect until the close of the meeting. Accordingly, the election of officers, Wednesday afternoon, was held under the old plan and no opportunity was offered to study the new plan in actual operation.

The report of the Secretary-Editor showed a healthy increase in membership over the preceding year. The number of applications for membership (almost 400) filed during the year was

the largest for some time. The Association lost thirty-eight members by death since the 1927 meeting. The report stated that the dues of more members were paid right up to date than at any time during the past five years. It had been necessary to drop considerably less than the usual number for the non-payment of dues the past year, and the list of resignations was the shortest for some time. The new members added September 1 boost the membership over the 3800 mark and the applications now on file, when completed, will increase the number well over the 3900 mark.

That part of the report dealing with the JOURNAL was equally gratifying. It was stated that the July issue of the JOURNAL contained more paid advertising than any other issue during the past five years and the circulation for the current month was also at the highest point reached during this period.

The financial statement of Treasurer Jacob, covering the first seven months of the year 1928, showed a shrinkage in the cash resources of about \$2,000. This was largely the result of the rather heavy expenditures upon the part of the Committee on Legislation, in connection with the fight to secure better compensation for veterinarians in the B. A. I. service. Other expenses of the Association have been increasing right along, keeping pace with the expanding activities of the organization.

Dr. T. E. Munce, of Harrisburg, Pa., director of the Pennsylvania Bureau of Animal Industry, was the unanimous choice for President. More will be said of Dr. Munce elsewhere. Vice-presidents were elected as follows:

First Vice-President, Dr. Seymour Hadwen, Saskatoon, Sask.

Second Vice-President, Dr. W. A. Axby, Harrison, Ohio.

Third Vice-President, Dr. O. M. Norton, Greenville, Miss.

Fourth Vice-President, Lt. Col. Robt. C. Musser, V. C., U. S.  
Army.

Fifth Vice-President, Dr. W. G. Hollingworth, Utica, N. Y.

Dr. M. Jacob, of Knoxville, Tenn., was unanimously elected Treasurer for his eleventh consecutive term, beginning January 1, 1929.

In the four sections officers were elected as follows:

*Section on General Practice*

Chairman—Dr. W. M. Bell, Nashville, Tenn.

Secretary—Dr. E. P. Althouse, Sunbury, Pa.

*Section on Sanitary Science and Food Hygiene*

Chairman—Major R. A. Kelser, Washington, D. C.

Secretary—Dr. F. H. Brown, Indianapolis, Ind.

*Section on Education and Research*

Chairman—Dr. H. E. Biester, Ames, Iowa.

Secretary—Dr. W. A. Hagan, Ithaca, N. Y.

*Section on Small Animals*

Chairman—Dr. Cbas. W. Bower, Topeka, Kans.

Secretary—Dr. H. J. Milks, Ithaca, N. Y.



THE A. V. M. A. CLINIC AT UNIVERSITY FARM

Dr. C. H. Case, of Akron, Ohio, demonstrating diagnosis and treatment of sterility.

Detroit, Michigan, was selected as the 1929 convention city. Washington, D. C., was the only other contender, in spite of the fact that half a dozen cities had earlier indicated a desire to have the next meeting. Los Angeles and Kansas City put in bids for the 1930 convention.

An unusually large number of meetings of college alumni associations were held Tuesday evening. It is hoped that we will be able to publish a brief report of every one of these meetings. The President's reception and dance followed and proved to be a very enjoyable occasion in spite of the warm weather.

All committee reports were on hand when called for. These will be published in full in the proceedings in the next issue of the JOURNAL and for that reason only very brief comments will be made at this time. The report of the Committee on Legislation, among other things, stated that the efforts put forth to prevent an increase in the amount of the narcotic license fee to be paid by veterinarians had been successful. This really means that the efforts of this committee resulted in a saving of \$2.00 per year to every veterinarian in the United States who takes out a permit to use narcotics.

The Committee on Intelligence and Education recommended that no change be made in the name "veterinarian." A report of progress was made in the work of studying the courses of study in veterinary subjects being offered by the various agricultural colleges. The Committee on Veterinary Biologies made notable progress during the year and has already classified a number of veterinary biologics now in common use. The Committee on Schmidt Memorial reported that the work of raising funds for a memorial to Dr. Schmidt had been completed and the memorial had been dedicated with appropriate ceremonies. A member of the committee, Dr. H. Jensen, of Kansas City, was present when the dedication was made, as the official representative of the A. V. M. A.

One of the most important committee reports made at the meeting was that of the Committee on Proprietary Pharmaceuticals. It seemed to be the consensus of opinion of a great many members that this new activity of the A. V. M. A. was one of the most important to be taken up during recent years. It would be well for every member of the Association to study this report, with the discussion which followed, when it is published in the official proceedings next month.

The Committee on International Veterinary Congress reported that the date for the next congress has been definitely fixed for 1930. The report of the Committee on Humane Society Hospitals was awaited with keen anticipation by veterinarians in general, and particularly those located in our large cities. The report presented by Dr. Robert S. MacKellar, of New York City, was highly encouraging and indicated that a solution of the problem was in sight.

The following were elected to honorary membership:

Prof. C. E. Gerhard Forssel, Veterinary High School, Stockholm, Sweden.

Dr. Sven Wall, State Veterinary-Bacteriological Institute, Stockholm, Sweden.

Prof. Naoshi Nitta, Imperial University of Tokyo, Tokyo, Japan.

The sectional meetings held Wednesday and Thursday mornings were very well attended. In fact, the rooms which had been provided for some of the sections proved inadequate to accommodate the large numbers which had been attracted by the papers announced for these sections. The general session Thursday evening brought out one of the largest crowds of the week. Standing room was at a premium while Dr. Charles H. Mayo



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Dr. T. H. Ferguson, of Lake Geneva, Wis., was on the program for surgery of the foot and udder.

was delivering his address on tuberculosis. This is being published in full in this issue of the JOURNAL.

The banquet Wednesday evening was another outstanding event in connection with the meeting. Approximately 400 attended and the program which had been arranged by Dr. C. P. Fitch, chairman of the Subcommittee on Banquet, proved to be a highly enjoyable one. Dr. David S. White acted as toastmaster and everybody agreed that he was "in form." Some unusually fine musical numbers were given in connection with the after-dinner speeches. These were all well received, evidenced

by the numerous encores. Among those who were on the toast list were Lieutenant Governor Nolan, Dean Coffey, of the Department of Agriculture, University of Minnesota, and Dr. George Hilton, Veterinary Director General of Canada. The souvenir banquet program was an artistic affair and bore the seal of the American Veterinary Medical Association, embossed on the front cover. In all probability this afforded an opportunity for many members of the A. V. M. A. to see our official seal for the first time.

The climax of the convention was reached on Friday, at University Farm, where the clinic was staged in six sections, running simultaneously. Dr. W. L. Boyd, chairman of the Subcommittee on Clinic, and Dr. C. P. Fitch, chief of the Veterinary Division, with their associates, were the recipients of a great deal of well-deserved praise for putting on one of the best clinics that members of the A. V. M. A. have ever had an opportunity to attend. The buildings and grounds at University Farm are ideally located and equipped for putting on a clinic of large proportions. Some of the demonstrations were given inside of the buildings and others were put on outdoors. The six sections included horses, cattle, small animals, sheep, swine and poultry. Leaders in these different fields of practice had been selected in advance and were on hand to give demonstrations, perform operations and explain the latest methods of diagnosis and treatment. A picnic lunch was served during the noon hour, on which occasion the gentlemen were joined by the ladies, who had been escorted through St. Paul on a sight-seeing trip during the morning.

The Women's Auxiliary held a very successful meeting Wednesday afternoon. Mrs. Peter Malcolm, of Des Moines, Iowa, was elected president of the organization. Mrs. Arthur Spitz, of Philadelphia, Pa., Mrs. Hamlet Moore, of New Orleans, La., Mrs. H. D. Bergman, of Ames, Iowa, and Mrs. C. P. Fitch, of St. Paul, Minn., were elected first, second, third and fourth vice-presidents respectively. Almost 500 ladies registered during the week.

Some very good newspaper publicity was secured, due to the efforts put forth by Dr. Donald B. Palmer, chairman of the Subcommittee on Publicity. The number of exhibitors was larger than usual. The space originally set aside for the exhibits on the mezzanine floor of the hotel proved to be inadequate and the overflow extended up onto the third floor. Dr. John S. Dick chairman of the Subcommittee on Exhibits, and Dr. William C.

Prouse, chairman of the Committee on Hotels, looked after the comforts of the large number of exhibitors in attendance.

In spite of the unusually large number of persons who attended the meeting, only 175 railroad certificates were turned in. As a result, the certificate plan fell through. Other organizations have reported the same experience, indicative of the inroads which automobile travel has been making on the railroads.

To Dr. Charles E. Cotton, generalissimo of the Local Committee on Arrangements, goes the lion's share of the praise for the huge success of the meeting. His outstanding executive ability in organizing his subcommittees and directing their



THE A. V. M. A. CLINIC AT UNIVERSITY FARM  
Two well-known Minnesota veterinarians, Drs. W. L. Boyd (left) and C. S. Shore (right), demonstrating some fine points in restraint.

activities was in evidence on every hand. To Mrs. W. L. Boyd and Dr. W. J. Fretz, chairmen respectively of the committees charged with looking after the entertainment for the ladies and gentlemen, go the heartfelt thanks of everybody who participated in the events arranged for their pleasure and comfort. And we must not forget another very important subcommittee—that on finance—with Dr. G. E. Totten as chairman. Had it not been for the efforts of this important part of Dr. Cotton's well-oiled machine, working quietly behind the scenes, the meeting might not have been the great success it turned out to be. To enter-

tain the A. V. M. A. has become quite a job. To say that the Minnesota veterinarians distinguished themselves is putting it very mildly.

### CONVENTION NOTES

Dr. E. M. Pickens, of College Park, was the only member from Maryland.

Dr. W. W. Dimock was the sole representative from the Blue Grass State.

South Carolina's sole representative was Dr. W. A. Barnette, of Greenwood.

Dr. L. E. Case, Territorial Veterinarian of Hawaii, was among the early arrivals.

Dr. W. H. Dodge, of Leominster, Mass., was the only registrant from the Bay State.

Drs. H. M. Newton and S. E. Hershey, of Charleston, upheld the honor of West Virginia.

Dr. George H. Glover, of Fort Collins, was the only Colorado veterinarian at the meeting.

Wyoming was represented by Drs. J. T. Dallas and S. E. Springer, both of Cheyenne.

Dr. E. E. Wegner, of Pullman, was the sole representative of Washington at the convention.

Dr. A. C. Johnson, of Cedar City, and Dr. F. E. Murray, of Salt Lake City, represented Utah.

Dr. A. L. Edmunds, of Franklin, N. H., was the only veterinarian present from the Granite State.

Oregon's two best-known veterinarians were present: Drs. W. H. Lytle, of Salem, and B. T. Simms, of Corvallis.

Dr. G. A. Roberts, of Lavras, Minas, Brazil, undoubtedly traveled the greatest distance in coming to the meeting.

Three members represented North Carolina: Drs. Wm. Moore and A. A. Husman, of Raleigh, and H. Calvin Rea, of Charlotte.

About thirty members at the meeting this year in Minneapolis were among those who attended the meeting held in Minneapolis in 1902.

A well-known trio represented New Jersey: Drs. James T. Glennon, Newark; W. Runge, Madison, and George B. Vliet, Hackettstown.

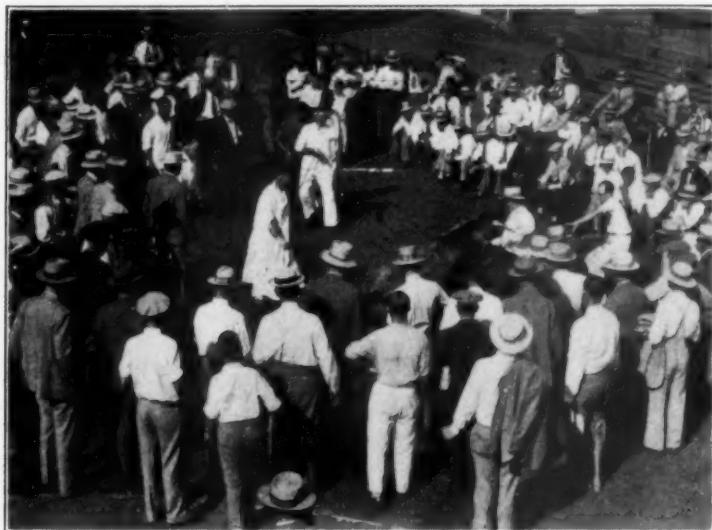
Ten ex-presidents of the A. V. M. A. were in attendance: Glover, Marshall, Mohler, Cotton, Cary, White, Kinsley, Stange, Merillat and Sigler.

A trio of veterinarians registered from Montana: Drs. C. A. Hattersheid, of Glendive; H. Marsh, of Helena, and F. M. Nelson, of Livingstone.

Oklahoma was another state with a trio of members on the register: Drs. R. W. Bowerman, Oklahoma City; Louis H. Moe, Stillwater, and H. W. Orr, Stillwater.

Dr. C. C. Palmer, of Newark, the only member from Delaware at the convention, was very busy renewing his acquaintance among the profession in the Twin Cities.

Nine of the thirteen veterinary colleges were represented by their deans, as follows: Cary, of Alabama; Dykstra, of Kansas;



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Dean Wegner, of Pullman, Washington, at the end of his rope.

Giltner, of Michigan; Glover, of Colorado; Klein, of Pennsylvania; Stange, of Iowa; Wegner, of Washington; White, of Ohio, and McGilvray, of Ontario.

Only five states west of the Mississippi River were not represented: Arizona, Idaho, Louisiana, Nevada and New Mexico. All states east of the Mississippi River had at least one member present, except four of the New England states: Connecticut, Maine, Rhode Island and Vermont.

The names of fourteen members from the Keystone State were found on the list of those present: Drs. E. P. Althouse, Sunbury;

M. F. Barnes and T. E. Munce, Harrisburg; E. E. Bittles, Waterford; Chas. W. Boyd, Sewickley; E. L. Cornman, Marietta; C. D. Evans, Kane; H. W. Turner, New Hope; F. N. Sherick, Connellsville; M. W. Drake, Wm. H. Ivens, Louis A. Klein, C. J. Marshall and H. K. Wright, Philadelphia.

The Empire State swelled the attendance with fourteen members: Drs. R. G. Bose, Troy; Chas. S. Chase, Bay Shore; E. C. Cleveland, Jr., Cattaraugus; J. Elliott Crawford, Far Rockaway; A. Eichhorn, Pearl River; J. N. Drost, W. A. Hagan, and H. J. Milks, Ithaca; Carl B. Hanson, Saratoga Springs; Wm. H. Kelly, Albany; H. Kock, Brooklyn; H. K. Miller, Mamaroneck; R. S. MacKellar and B. T. Woodward, New York.

### APPLICATIONS FOR MEMBERSHIP

(See May, 1928, JOURNAL)

#### FIRST LISTING

ABRAMSON, ALEXANDER HENRY 639 Buchanan Place, West New York, N. J.  
D. V. S., New York University, 1919  
Vouchers: Thomas E. Smith and Henry H. Haigh.

ALLEN, STANLEY W. Watertown, S. Dak.  
M. D. C., Chicago Veterinary College, 1907  
Vouchers: C. C. Lipp and M. W. Ray.

BALL, LEROY C. Titonka, Iowa  
D. V. M., McKillip Veterinary College, 1915  
Vouchers: C. H. Stange and John B. Bryant.

BANKS, C. H. Tipton, Iowa  
D. V. M., Iowa State College, 1912  
Vouchers: Grant B. Munger and John B. Bryant.

BENNETT, ARCH W. 2729 Coral St., Sioux City, Iowa  
D. V. M., McKillip Veterinary College, 1913  
Vouchers: E. S. Dickey and G. E. Golden.

BILDEN, LEONARD MELVIN Northwood, N. Dak.  
D. V. M., Ohio State University, 1922  
Vouchers: H. L. Frost and A. F. Schalk.

BJORNSEN, BENEDICT K. Mandan, N. Dak.  
D. V. M., Ohio State University, 1917  
Vouchers: W. F. Crewe and J. W. Robinson.

BLAKE, ARTHUR LEE 2622 Washington Ave., Sioux City, Iowa  
D. V. M., Ohio State University, 1911  
Vouchers: E. S. Dickey and H. E. Breckerbaumer.

BLOEMERS, JOHN D. 121 Seventh Ave. S., South St. Paul, Minn.  
D. V. M., Grand Rapids Veterinary College, 1913  
Vouchers: G. E. Totten and Irvin Owens.

BRATAGER, C. B. c/o Morrell & Co., Sioux Falls, S. Dak.  
D. V. M., Chicago Veterinary College, 1917  
Vouchers: W. C. Mitchell and J. O. Wilson.

BROLLING, A. M. 1014 13th Ave. S., Fargo, N. Dak.  
D. V. M., Kansas City Veterinary College, 1916  
Vouchers: A. F. Schalk and H. P. Roberts.

BROOKS, JOHN MULLETT 1823 Mackinaw St., Saginaw, S. W., Mich.  
V. S., Ontario Veterinary College, 1911  
Vouchers: Sam P. Heath and B. J. Killham.

**APPLICATIONS FOR MEMBERSHIP**

BRYAN, H. E.	D. V. M., Indiana Veterinary College, 1914 Vouchers: A. C. Drach and F. J. Muecke.	Angola, Ind.
BUCK, JOHN O.	D. V. M., Iowa State College, 1927 Vouchers: R. A. Merrill and Ben Anderson.	Hills, Minn.
CAMERON, F. R.	D. V. M., McKillip Veterinary College, 1918 Vouchers: Harry Hedin and L. A. Benson.	Hawley, Minn.
CASEY, PATRICK H.	M. D. V., McKillip Veterinary College, 1911 Vouchers: Charles E. Cotton and H. Preston Hoskins.	Farmington, Minn.
CATLIN, ORRIS I.	D. V. M., Ohio State University, 1918 Vouchers: R. Fenstermacher and Harry Hedin.	Moorhead, Minn.
CHAPMAN, GEORGE W.	M. D. C., Chicago Veterinary College, 1908 Vouchers: C. C. Lipp and J. O. Wilson.	Webster, S. Dak.
CHASE, DENNIS H.	V. S., Ontario Veterinary College, 1903 Vouchers: D. M. Swinehart and O. V. Brumley.	Manchester, Ohio
COMBS, LAWRENCE GLENN	V. M. D., Indiana Veterinary College, 1909 Vouchers: Robert J. Foster and Charles B. Dunphy.	Corozal, Canal Zone
CORNELL, WILLIAM A.	1605 St. Aubin St., Sioux City, Iowa D. V. M., Kansas City Veterinary College, 1917 Vouchers: E. S. Dickey, G. E. Golden and H. J. Lawrence.	
COX, JOHN L.	D. V. M., Ohio State University, 1928 Vouchers: Warren P. S. Hall and Reuben Hiltz.	432 11th St., Toledo, Ohio
CURRY, HUGH EDWARD	United Serum Co., Wichita, Kans. D. V. S., Kansas City Veterinary College, 1908 Vouchers: A. T. Kinsley and Chas. W. Bower.	
DORMAN, GEORGE M.	3600 Sixth Ave., Sioux City, Iowa D. V. M., St. Joseph Veterinary College, 1918 Vouchers: E. S. Dickey and G. E. Golden.	
DURHAM, JESSE W.	329 Eighth Ave. S., Fargo, N. Dak. V. S., Ontario Veterinary College, 1894 Vouchers: A. F. Schalk and H. P. Roberts.	
EBRIGHT, GLENN L.	214 Fayette St., Hammond, Ind. M. D. C., Chicago Veterinary College, 1908 Vouchers: J. V. Lacroix and T. A. Sigler.	
ELLIS, WILLIS V.	1207 S. Cecelia, Sioux City, Iowa D. V. M., Iowa State College, 1909 Vouchers: E. S. Dickey and G. E. Golden.	
ERICKSON, C. B.	D. V. M., Ohio State University, 1925 Vouchers: C. L. Campbell and L. R. Twete.	Pelican Rapids, Minn.
ERICKSON, HENRY E.	299 W. University Ave., St. Paul, Minn. V. S., Ontario Veterinary College, 1922 Vouchers: H. C. H. Kernkamp and R. Fenstermacher.	
FIEGE, HARVEY J.	3804 Sixty-third St., Kenosha, Wis. D. V. M., Michigan State College, 1925 Vouchers: A. J. Abbott and J. S. Matteson.	
GABRIEL, MARIE	Institut Agricole d'Oka, La Trappe, Que. M. D. V., University of Montreal, 1928 Vouchers: Albert A. Etienne and George Etienne.	

GETTELMAN, GEORGE A.	Hartford, Wis.
M. D. C., Chicago Veterinary College, 1907	
Vouchers: James S. Healy and H. D. Larzelere.	
GIDLEY, THOS. W.	Malvern, Iowa
D. V. M., McKillip Veterinary College, 1903	
Vouchers: H. D. Bergman and W. F. Guard.	
GISEL, EMIL O.	1126 Cornelia St., Sioux City, Iowa
D. V. M., McKillip Veterinary College, 1917	
Vouchers: E. S. Dickey and G. E. Golden.	
HADLEY, L. M.	Ruthven, Iowa
D. V. M., Iowa State College, 1920	
Vouchers: N. L. Nelson and P. V. Neuzil.	
HATTERSCHEID, C. A.	Glendive, Mont.
M. D. C., Chicago Veterinary College, 1903	
Vouchers: Hadleigh Marsh and Joab P. Foster.	
HELMER, H. O.	Cooperstown, N. Dak.
D. V. M., Kansas City Veterinary College, 1913	
Vouchers: A. F. Schalk and H. P. Roberts.	
HEUSINKVELD, MARK	4816 Morningside Ave., Sioux City, Iowa
D. V. M., Chicago Veterinary College, 1918	
Vouchers: E. S. Dickey and G. E. Golden.	
HOFFMAN, ASA A.	Box 299, Detroit Lakes, Minn.
D. V. M., Kansas City Veterinary College, 1906	
Vouchers: R. Fenstermacher and H. C. H. Kernkamp.	
HOLLECKER, EDWARD B.	600 N. 17th St., Kansas City, Kans.
D. V. S., Kansas City Veterinary College, 1911	
Vouchers: R. R. Dykstra and J. C. Flynn.	
HOWELL, MARTIN ELMER	413 N. Prairie Ave., Sioux Falls, S. Dak.
D. V. M., St. Joseph Veterinary College, 1916	
Vouchers: A. T. Kinsley and M. W. Ray.	
JARVIS, KING C.	Dept. of Agriculture, Capitol Bldg., Sacramento, Calif.
D. V. M., Iowa State College, 1922	
Vouchers: J. P. Iverson and A. C. Rosenberger.	
JOHNSON, CHESTER LAWRENCE	Harvey, N. Dak.
D. V. M., Chicago Veterinary College, 1914	
Vouchers: A. F. Schalk and H. P. Roberts.	
KEMEN, MATHIAS JOHN	722 State Office Bldg., Lansing, Mich.
D. V. M., Chicago Veterinary College, 1916	
Vouchers: T. S. Rich and M. P. Hunt.	
KLETTI, ALVIN J.	Slinger, Wis.
V. S., Ontario Veterinary College, 1908	
Vouchers: Edward Boesewetter and F. B. Hadley.	
LAFAYETTE, WALTER W.	2543 S. Cypress St., Sioux City, Iowa
D. V. M., Colorado Agricultural College, 1920	
Vouchers: E. S. Dickey and G. E. Golden.	
LAIRD, W. R.	Sioux Falls, S. Dak.
D. V. M., Iowa State College, 1911	
Vouchers: John Doerr and N. L. Nelson.	
LAUDERDALE, BYRON NEWMAN	Box 364, Madison, Fla.
D. V. M., Alabama Polytechnic Institute, 1917	
Vouchers: T. W. Cole and R. L. Brinkman.	
LEWIS, GAYLORD T.	7121 Oklahoma Ave., Cincinnati, Ohio
D. V. M., Cincinnati Veterinary College, 1915	
Vouchers: D. M. Swinehart and E. P. Maxwell.	
LINDQUIST, W. E.	2841 30th Ave. S., Minneapolis, Minn.
D. V. M., Chicago Veterinary College, 1917	
Vouchers: Harry Hedin and R. R. Donaldson.	

**LINNEMANN, MARTIN C.** St. Joseph, Minn.  
 D. V. M., Chicago Veterinary College, 1916  
 Vouchers: R. Fenstermacher and H. Preston Hoskins.

**LOWE, JOHN H.** c/o Dr. J. W. Murdoch, Capitol Station, Helena, Mont.  
 D. V. M., Iowa State College, 1900  
 Vouchers: W. L. Carson and G. H. Ehlers.

**MAYER, NELSON J.** Box 680, Mitchell, S. D.  
 M. D. C., Chicago Veterinary College, 1908  
 Vouchers: C. C. Lipp and J. O. Wilson.

**MCBAIN, WILLIAM E., JR.** 3829 Hazelhurst, Toledo, Ohio  
 M. D. C., Chicago Veterinary College, 1894  
 Vouchers: Warren P. S. Hall and Reuben Hiltz.

**MCKENZIE, PETER** Aneta, N. Dak.  
 D. V. M., Ohio State University, 1921  
 Vouchers: H. L. Foust and A. F. Schalk.

**MCKENZIE, WRAITH H.** 138 Chittenden Ave., Columbus, Ohio  
 D. V. M., Ohio State University, 1913  
 Vouchers: D. M. Swinehart and W. H. Feldwisch.

**MC LAUGHLIN, EDWARD JOSEPH** P. O. Box 335, Salisbury, Md.  
 D. V. M., George Washington University, 1913  
 Vouchers: I. K. Atherton and R. C. Reed.

**MEHAN, JOSEPH A.** 351 E. New St., Lancaster, Pa.  
 V. M. D., University of Pennsylvania, 1928  
 Vouchers: G. A. Dick and E. T. Booth.

**MELVIN, V. W.** 3944 Almeda Drive, Toledo, Ohio  
 D. V. M., Cincinnati Veterinary College, 1915  
 Vouchers: Warren P. S. Hall and Reuben Hiltz.

**METCALF, CARL V.** 1310 Lincoln Ave., St. Paul, Minn.  
 D. V. M., McKillip Veterinary College, 1918  
 Vouchers: G. E. Totten and M. E. Schwab.

**MIKOLAI, IGNATIUS E.** Wells, Minn.  
 D. V. M., McKillip Veterinary College, 1918  
 Vouchers: W. L. Boyd and R. Fenstermacher.

**MILLER, LEON E.** 1732 Arlington, Toledo, Ohio  
 D. V. M., Cincinnati Veterinary College, 1915  
 Vouchers: Warren P. S. Hall and Reuben Hiltz.

**NEELEY, SAMUEL WRIGHT** 325 E. Broadway, Toledo, Ohio  
 D. V. M., Ohio State University, 1927  
 Vouchers: Warren P. S. Hall and Reuben Hiltz.

**NELSON, FRANK M.** Box 43, Livingston, Mont.  
 D. V. M., Kansas City Veterinary College, 1913  
 Vouchers: Hadleigh Marsh and W. L. Boyd.

**NOLLER, OTTO WILLIAM** 6th & Gage Sts., Topeka, Kans.  
 D. V. S., Kansas City Veterinary College, 1910  
 Vouchers: J. C. Flynn and R. R. Dykstra.

**OAKES, G. H.** Hunter, N. Dak.  
 D. V. M., McKillip Veterinary College, 1916  
 Vouchers: A. F. Schalk and H. P. Roberts.

**PAINTER, G. G.** Jackson Center, Ohio  
 D. V. S., Grand Rapids Veterinary College, 1916  
 Vouchers: D. M. Swinehart and Reuben Hiltz.

**PARSHALL, CHARLES JONAS** 1130 N. 13th St., Fargo, N. Dak.  
 D. V. M., Cornell University, 1928  
 Vouchers: H. P. Roberts and A. F. Schalk.

**PETERSON, WILLIAM LANGDON** 336 E. Lafayette St., Stockton, Calif.  
 D. V. S., San Francisco Veterinary College, 1917  
 Vouchers: A. I. Sorenson and A. C. Rosenberger.

QUELLAND, JOHN D. 272 Fillmore Ave., Pierre, S. Dak.  
D. V. M., Kansas City Veterinary College, 1915  
Vouchers: J. O. Wilson and M. W. Ray.

RAJOTTE, ARTHUR Drummondville, Que.  
M. D. V., University of Montreal, 1915  
Vouchers: Albert A. Etienne and George U. Etienne.

RAWN, EDWARD Luck, Wis.  
D. V. M., Royal Veterinary College, Copenhagen, 1908  
Vouchers: F. B. Hadley and J. S. Healy

REIHART, O. F. 4802 S. 25th St., South Side Sta., Omaha, Nebr.  
D. V. M., Chicago Veterinary College, 1915  
Vouchers: Ashe Lockhart and Frank Breed.

RICHARDS, H. S. 210 Swope St., Pittsburgh, Pa.  
V. S., Ontario Veterinary College, 1887  
Vouchers: T. E. Munce and S. E. Bruner.

RODERICK, LEE M. State College Station, Fargo, N. Dak.  
D. V. M., Ohio State University, 1915  
Ph. D., University of Chicago, 1926  
Vouchers: A. F. Schalk and H. P. Roberts.

SANDERS, ELLMORE FRANKLIN Massachusetts Agricultural College, Amherst, Mass.  
D. V. M., Kansas State Agricultural College, 1927  
Vouchers: W. R. Hinshaw and John B. Lentz.

SASS, CLARENCE WILLIAM 827 Colburn St., Toledo, Ohio  
D. V. M., McKillip Veterinary College, 1920  
Vouchers: Reuben Hiltz and Robert Conover.

SAUNDERS, FRANCIS HAROLD 336 E. Lafayette St., Stockton, Calif.  
D. V. M., State College of Washington, 1921  
Vouchers: A. I. Sorenson and A. C. Rosenberger.

SCHLEGEI, JOHN O. 3600 6th Ave., Sioux City, Iowa  
D. V. S., Kansas City Veterinary College, 1911  
Vouchers: E. S. Dickey and G. E. Golden.

SCHNEIDER, ERNEST 914 7th St., Bismarck, N. Dak.  
M. D. C., Chicago Veterinary College, 1908  
Vouchers: A. F. Schalk and H. P. Roberts.

SCOTT, JOHN R. Highmore, S. Dak.  
D. V. M., Iowa State College, 1924  
Vouchers: A. L. Born, Donald B. Palmer and C. C. Lipp.

SLOCUM, ARTHUR E. c/o Govt. Office, John Morrell & Co., Sioux Falls, S. Dak.  
D. V. M., Colorado Agricultural College, 1920  
Vouchers: W. C. Mitchell and J. O. Wilson.

SMITH, EDWIN REED Fort Meigs Hotel, Toledo, Ohio  
D. V. M., Michigan State College, 1919  
Vouchers: Robert Conover and Warren P. S. Hall.

SPAYTH, GUY V. Bloomville, Ohio  
D. V. M., Grand Rapids Veterinary College, 1915  
Vouchers: D. M. Swinehart and O. V. Brumley.

SPRAGUE, A. W. 3079 S. 32nd St., Omaha, Nebr.  
D. V. M., Iowa State College, 1910  
Vouchers: W. T. Spencer and M. Jacob.

STILLEY, LOUIS E. Greenleaf, Kans.  
D. V. M., Kansas City Veterinary College, 1917  
Vouchers: A. T. Kinsley and Chas. W. Bower.

STROMLUND, ERNEST V. 3334 Orelans Ave., Sioux City, Iowa  
D. V. S., Kansas City Veterinary College, 1911  
Vouchers: E. S. Dickey and G. E. Golden.

TERRY, EDWARD EVERETT 3603 Welsh Rd., Holmesburg, Philadelphia, Pa.  
V. M. D., University of Pennsylvania, 1893  
Vouchers: G. A. Dick and E. T. Booth.

VOLLMER, CARL G. R. F. D. No. 8, West Toledo, Ohio  
V. S., Ontario Veterinary College, 1908  
Vouchers: Robert Conover and Warren P. S. Hall.

WALSH, A. L. Thief River Falls, Minn.  
D. V. M., Chicago Veterinary College, 1920  
Vouchers: F. J. Muecke and W. J. Fretz.

WETTER, CHARLES H. Princeton, Minn.  
D. V. M., McKillip Veterinary College, 1920  
Vouchers: C. H. Haggard and Donald B. Palmer.

WHEALY, J. A. 408 N. Euclid Ave., Sioux Falls, S. Dak.  
D. V. M., St. Joseph Veterinary College, 1915  
Vouchers: W. C. Mitchell and J. O. Wilson.

WILLIAMS, CHARLES Sisseton, S. Dak.  
D. V. S., Chicago Veterinary College, 1891  
Vouchers: C. C. Lipp and M. W. Ray.

WIRTHLIN, JOHN R. 719 Julia Place, South Jacksonville, Fla.  
D. V. M., Cincinnati Veterinary College, 1917  
Vouchers: T. W. Cole and R. L. Brinkman.

WRINKLE, ELLERY P. O. Box 366, Oakdale, Calif.  
D. V. S., San Francisco Veterinary College, 1910  
Vouchers: J. P. Iverson and A. C. Rosenberger.

ZENOR, PERRY 2811 S. Cecelia St., Sioux City, Iowa  
B. S., Colorado Agricultural College, 1904  
M. D. C., Chicago Veterinary College, 1906  
Vouchers: E. S. Dickey and G. E. Golden.

### Applications Pending

#### SECOND LISTING

Allen, D. L., Newton, Miss.  
Billings, William A., University Farm, St. Paul, Minn.  
Bolle, Arthur C., Petersburg, Ill.  
Bond, Harold G., 335 Crestview Rd., Columbus, Ohio.  
Campbell, H. L., Tuscola, Ill.  
Coon, Elvin R., P. O. Box 157, Winamac, Ind.  
Crawford, John H., Hinckley, Ill.  
Darke, Carlisle N., 103-19 Springfield Blvd., Queens Village, N. Y.  
Dennie, Frank W., 5346 Park Ave., Indianapolis, Ind.  
Dennis, T. M., Clanton, Ala.  
Durant, Adrian Jackson, Veterinary Department, University of Missouri.  
Columbia, Mo.  
Foster, T. J., Monticello, Ill.  
Griessman, Louis, Nanuet, N. Y.  
Haenn, Joseph E., 343 Bourse Bldg., Philadelphia, Pa.  
Halloran, D. J., Colton, S. Dak.  
Hartwich, Homer A., Huron, S. Dak.  
Hectorne, Ronald L., Avon, Ill.  
Jones, Frederick B., 922 Peoria St., Dixon, Ill.  
Joyce, Charles Otto, Wanamaker, Ind.  
Kay, David Scott, 3208 36th Ave. S. W., Seattle, Wash.  
Kraus, Alvin Herman, Marengo, Iowa.  
Lockridge, Forest R., 208 Morgan St., Crawfordsville, Ind.  
Lowe, Albert Claud, Buckhannon, West Va.  
Marshall, John Wesley, Genoa, Ohio.  
McClure, Fred K., 310 S. Chestnut St., Clarksburg, West Va.  
McDowell, Clarence, Aberdeen, S. Dak.  
Mersch, Louis D., Sioux Falls Serum Company, Sioux Falls, S. Dak.  
Murdock, D. C., 1316 South 33rd St., Omaha, Nebr.  
Nisley, Frank, Hershey, Pa.  
O'Neill, Robert Kenneth, 12041 E. Jefferson Ave., Detroit, Mich.  
Owens, James A., El Paso, Ill.

Phelps, Oscar S., 322 E. Maple Ave., Beaver Dam, Wis.  
Robinson, Ray S., Madison, S. Dak.  
Rugger, Fred Ernest, Lowden, Iowa.  
Schrumpf, Harry Russel, 345 N. Jefferson Ave, Indianapolis, Ind.  
Scott, Paul Franklin, New Market, Ind.  
Selemeyer, Chas. W., 820 S. Newberry St., York, Pa.  
Shlimovitz, Benjamin, Black River Falls, Wis.  
Smith, Forest F., Emery, S. Dak.  
Tovar, Daniel Alfredo, Casilla 237, Callao, Peru, S. A.  
Uren, Andrew Waldmere, 714 Stewart Rd., Columbia, Mo.  
Wanke, V. F., Belleville, Wis.  
Watt, C. S., Collinsville, Ill.

The amount which shall accompany an application filed this month is \$6.67, which covers membership fee and dues to January 1, 1929, including subscription to the JOURNAL.

### COMING VETERINARY MEETINGS

New York City, Veterinary Medical Association of. Academy of Medicine, 5th and 103rd St., New York, N. Y. September 5, 1928. Dr. C. P. Zepp, Secretary, 128 W. 53rd St., New York, N. Y.

Chicago Veterinary Society. Great Northern Hotel, Chicago, Ill. September 11, 1928. Dr. J. B. Jaffray, Secretary, 2956 Washington Blvd., Chicago, Ill.

Kansas City Association of Veterinarians. New Baltimore Hotel, Kansas City, Mo. September 18, 1928. Dr. J. D. Ray, Secretary, 400 New Centre Bldg., Kansas City, Mo.

Southern California Veterinary Medical Association. Chamber of Commerce Building, Los Angeles, Calif. September 19, 1928. Dr. W. L. Curtis, Secretary, 1264 W. 2nd St., Los Angeles, Calif.

Indiana-Illinois Veterinary Medical Association. Odon, Ind. September 21, 1928. Dr. Frank M. Tade, Secretary, Vincennes.

Maine Veterinary Medical Association. De Witt Hotel, Lewiston, Me. October 10, 1928. Dr. C. F. French, Secretary, 87 Summer St., Rockland, Me.

Pennsylvania State Veterinary Medical Association. Laboratory, Pennsylvania Bureau of Animal Industry, Harrisburg, Pa. October 16-17, 1928. Dr. H. R. Church, Secretary, Harrisburg, Pa.

Ontario Veterinary Medical Association. Ontario Veterinary College, Guelph, Ont. October 17-18, 1928. Dr. H. M. LeGard, Secretary, 223 Main St. N., Weston, Ont.

United States Live Stock Sanitary Association. La Salle Hotel, Chicago, Ill. December 5-7, 1928. Dr. O. E. Dyson, Secretary, 45 Live Stock Exchange Bldg., Wichita, Kans.

## ADDRESS OF THE PRESIDENT\*

*By REUBEN HILTY, Toledo, Ohio*

In the first place, I desire to express my most heartfelt appreciation of the great honor which you conferred on me at Philadelphia last year. To me, my election was a gratifying incident, because it was at Philadelphia, in 1908, that I was elected to membership in this Association. In now acknowledging your kindness, I desire to share this signal honor with every practicing veterinarian in the United States and Canada, for I was elected as a representative of that large group of members who practice the art of veterinary medicine and not on account of any particular ability or virtue that I myself possess.

To occupy the office of executive head of the American Veterinary Medical Association is not only a position of great honor but one which, if conscientiously filled, demands a great deal of time, serious thought and earnest endeavor.

The past year has been, to me, one of a great deal of satisfaction, as well as pleasure, in the things accomplished by our Association. There seemed to be a keen interest manifest wherever veterinarians chanced to be in conference, and a more lively interest in the welfare of the profession in general than has been manifest for some time. To those of us who love our profession the motto must ever be, "Onward and upward," for this seems to have been the motto of those earnest men, who, long years ago, formed the nucleus of this wonderful organization, the most important of its kind in the whole world.

Let us hope that those of our members who shall be chosen to guide the destinies of this organization in the future may ever have at heart the deepest and best interests of the veterinary profession, rather than self praise, and shall strive that the onward pace shall not slacken, nor the upward tendency be checked. If we are to judge what the future shall be by what this organization has accomplished in the past, then most of our most optimistic dreams shall surely come true, but we must not forget that the responsibility for our present position and station lay with some of the most brilliant veterinarians the profession has ever known, some of whom were not rich as the world judges a man, but rich in the things that mean satisfaction to

\*Presented at the sixty-fifth annual meeting of the American Veterinary Medical Association, Minneapolis, Minn., August 7-10, 1928.

themselves and rich in the knowledge that builded so well the foundation of our organization. So enriched by the endowment of devotion to service and the advancement of our profession, which our predecessors in the executive chair left to us, may not those of our numbers who are to guide the future of this great body be encouraged and pushed on to accomplishments much greater, in keeping with the demands of a more exacting future.

#### DEATH TAKES HEAVY TOLL

We must not forget that the "grim reaper" has been unusually busy in our ranks during the past year. This reaper, as we well know, is no respecter of persons. This fact is brought home to us in the removal from our ranks of some of our most able counselors, as well as some of the finest characters in the veterinary profession. Men like the late Dr. John A. Kiernan, through whose death was left a void hard for the profession to fill. Following closely on this loss came the loss of another of our best known and beloved members, Dr. E. C. Schroeder, whose death again left a void hard to fill. In addition to the losses we have sustained in the regulatory and investigational branches of the profession, the past year has brought the deaths of quite a number of outstanding representatives among our practitioners. Time will not permit naming all of these, but as examples of the type of men in mind, I will mention such prominent practitioners as Dr. Robert W. McCully, of New York, N. Y., and Dr. Truman E. Gore, of Clarksburg, W. Va. Death removed one member from our honorary roll during the year, Hon. E. T. Meredith, of Des Moines, Iowa, Secretary of Agriculture in the cabinet of President Wilson. To these men the American Veterinary Medical Association owes much for their wonderful individuality, earnestness, devotion and ability. By their work we have profited to a degree we are unable to express in words. It is hoped that the Committee on Necrology will take due note of the death of all members called from our ranks during the past year.

I am of the opinion that the membership expects a presidential address to contain more or less of a résumé of the important things attempted by the organization officials and committees during the year; also I shall take the privilege of making suggestions for the future good of the organization, as I see them.

The work of the Executive Board during the year is to be highly commended. This Board has had a number of difficult problems before it, and let me assure you they have side-stepped none of them. A special committee was appointed by the chairman of the Board to study the feasibility of establishing a permanent home for the Association in some centrally located place. Representatives of this committee met at the Secretary's office to study the needs of the office and reported back to the Executive Board. The concensus of opinion of these men was that the Association should have a permanent home, and we should look forward to the purchase of such a home. They also were of the opinion that the Secretary should have an assistant, to lighten the load now carried by him and allow a greater service.

#### CONSTITUTION AND BY-LAWS

Later, at this meeting, the Executive Board will present a report embracing numerous suggested changes for our Constitution and By-laws. Almost without exception, these proposed amendments are designed for the purpose of facilitating the transaction of business and to enable the Association to function to better advantage, in keeping with changed conditions. The establishment of official headquarters for the Association and the employment of a full-time secretary-editor have brought many problems and conditions which did not exist under the old system of management. Some of these changes are absolutely necessary in order to give officers and committees more latitude, something which has been found absolutely necessary in connection with the expanding activities of the Association.

The Committee on Intelligence and Education did a fine piece of work in their study of the courses offered to students of agricultural schools, insofar as they relate to veterinary subjects.

The Committee on Legislation met with the Committee on Appropriations, at Washington. A number of prominent members of our Association spoke before this Committee in behalf of the Bureau employes. A most satisfactory hearing was given these men, with the result that the Bureau men were given substantial increases in salary.

Another committee was appointed to look for a suitable assistant to our Secretary. This is a hard matter, since a man to fill this position must have a number of qualifications that are rather hard to find in one man.

The matter of publicity for the profession has been a subject that has interested our Association for years and is being given some serious consideration by the Executive Board. Too many veterinarians mistake advertising for publicity. We have seen a great many of the most glaring forms of advertising, most of them in connection with advertising small-animal hospitals in the large cities where competition is keen. It should be brought to the attention of these men that the kind of advertising they are using not only places themselves in the class of the advertising specialist, so called, but does more or less harm to the profession in general in the eyes of other learned professional men. There is no doubt that something along the line of ethical publicity must be done and a recommendation will be made, further along in this address. A committee of men capable of studying this subject was appointed and no doubt will have some concrete suggestions to make on this important matter.

#### AMERICAN HUMANE ASSOCIATION

We have for several years heard numerous complaints from some of our larger cities against the methods used in the operation of animal shelters and hospitals by humane societies. A contact was made with Mr. Sydney H. Coleman, president of the American Humane Association, who was found to be very anxious that these differences should be ironed out. At his suggestion, a committee was appointed to confer with a similar committee appointed from his organization. These committees met on July 10, in New York City, and a most satisfactory agreement was reached. Our Association's committee was asked to outline a plan for humane societies to follow. During this meeting, you will be given the report of this committee. If only this one piece of work is finished and nothing more, I would feel that the year had been well spent.

Allow me to mention just one more accomplishment of the past year, all credit of which must be given to our most capable Secretary—that of holding a meeting of the Committee on Program and whipping into shape the completed program weeks before the date of the annual meeting. The program you have looked over is without a doubt the most comprehensive one ever offered to our Association members and I am only sorry that all of the 4,000 members can not sit with us and enjoy the good things offered. An earnest effort has been made to offer a well-

balanced program that would interest the largest possible number of veterinarians.

The time is long past, in fact never was, when a veterinarian could expect to keep abreast of the times unless he affiliates himself with organizations of this kind, at whose meetings are discussed the problems of the practicing veterinarian, as well as the problems of the sanitarian, the laboratory man and the research man. One branch of the profession can not expect to be successful without the cooperation of all the others. We are all aware that curative veterinary medicine is yet a very important part of the work of the veterinarian, but the veterinarian who expects to spend years to come in the profession must be able to give his clients more and more advice on disease prevention and for a considerable part of this knowledge we must depend on the men who spend their time and efforts in the research field of veterinary medicine. The field of preventive medicine is growing all the time and I am willing to make the prediction that before long we will have a great many veterinarians who will spend their time advising herd- and flock-owners on their sanitary problems for the prevention of disease. The intelligent breeder will be better satisfied to pay, and pay well, for advice to keep him out of trouble, than to pay well for relief after he has gotten into trouble and suffered large losses.

#### IMPORTANCE OF PREVENTIVE MEDICINE

Let me assure you that unless the practicing veterinarians pay more and more attention to so-called preventive medicine, we will be compelled to bow to state medicine. True, we must depend on state medicine in the handling of outbreaks of dangerous diseases, on account of the authority with which its men are clothed, but unless the practicing veterinarian is himself prepared to render the stockman this service in preventing disease in his herds and flocks, he will clamor for state medicine.

Allow me to picture to you what my idea of a veterinarian is. The standing of a veterinarian in his community depends altogether on himself. If he is capable in his professional accomplishments and demands the respect of the public through capable work and clean living, he will receive all the respect any other professional man receives.

A wide-awake veterinarian of today is a man among men in his community. He takes an interest in public affairs, in agriculture, in the problems of dairying, stock-raising of all kinds,

poultry-raising, and the diseases that make these industries unprofitable, if allowed to go unchecked. He is a man who never loses an opportunity to enlighten himself through any source whatsoever, whether that source be affiliating himself with the various veterinary organizations that are available to him, or live stock organizations, or any organization from which he can add anything to his store of knowledge that will be of benefit to his clientele.

It is, of course, a much easier matter for a veterinarian in a rural district, a small city or town, to make his contacts. There he is found sitting in their councils and is respected as much as any man. In the larger cities these contacts are harder to cultivate. In such places, everyone seems to be so busy making ends meet that they are liable to become much more selfish and care less for the association of others, but this may be accomplished if one really tries.

#### VETERINARIANS AND PET SHOPS

In many of the larger cities there has been for some years a practice developing that gives me a great deal of concern, as well as many other men with whom I have talked. This is the practice of mixing commercialism with the practice of veterinary medicine. I speak of the combination pet shop and veterinary hospital, owned and operated in most cases by a graduate veterinarian. Places of this kind are to me the greatest menace to ethical veterinary practice in our cities. The danger I see ahead for the profession in such places is that veterinarians in general will be judged, by the public, by the same standard used in measuring the pet shop proprietor who is not a veterinarian. The veterinarian who operates such a combination is liable to find it hard to sell his service. The owner of an animal is liable to expect to get consultation, service and remedy for the same price he pays for the remedies on the shelves of any other pet shop or drug store. It seems to me that the only thing a veterinarian should rightfully have to offer for sale is his service and make that the very highest type it is possible to make.

As I stated earlier in this address, I would take the privilege of making such recommendations for the good of the organization, as I see these recommendations:

1. *Publicity:* The veterinary profession has always been a more or less retiring, and at times even timorous, profession. We are, however, rapidly learning to assert ourselves in the

true light of accomplishments, not in a bombastic, egotistical manner, but in a well-poised, impartial attitude, which commands the respect of those whom we serve. Publicity has become an essential in the modern sale of any product, and the product of the veterinarian's training and skill is no exception. Other professions are using publicity campaigns to give to the public a better insight into the services which they are able to render. This has long been a question before our profession. There is no doubt in my mind but that a carefully planned campaign, carefully carried out, could not help but give the public a fuller realization of the need of the service a veterinarian can give. We have too long hidden behind the screen of self-consciousness and might it not be better for us if we would allow the world to grade our worth, fully informed of the services which a veterinarian has and is capable of rendering?

#### PUBLICITY VERSUS ADVERTISING

I am now speaking of legitimate publicity, not so-called advertising, which cheapens instead of benefits the profession. Instead, I mean publicity that will help us rise from a more or less obscure position to one of greater public approval. By this, not only will our own viewpoint become clearer, but our essential needs in the structure of modern life will become more obvious to all. We are a useful profession and have as good a right to inform the laity of our ability to cope with their live stock problems as has our sister profession of informing them of their ability to cope with human ills. I am certain that all veterinarians are proud of the accomplishments of our profession, which extends into a wide field of endeavor. I am also convinced that the general public is uninformed of our various activities and unlimited service.

Few people realize, and in reality appreciate that, except for the service of veterinarians, infectious and contagious diseases, to which our domestic animals, including poultry, are heir, would be so prevalent that profitable live stock production would be an utter impossibility. As proof as to the importance of this statement, one need but refer to the pages of history which furnish unmistakable evidence that the security and prosperity of any state and nation is in grave danger when its live stock industry begins to decay through the ravages of diseases that can be controlled and eradicated.

I recommend to this Association that as soon as possible the Secretary be given a suitable assistant, that some time may be given to a carefully planned campaign of publicity and that it be carried on by the Secretary's office under the direction of the Executive Board. I am of the opinion that more good could be done in this way than through a campaign carried on by a commercial advertising company.

2. *Section officers:* I recommend that the officers of the various sections be appointed by the president. The sections are often pressed for time to complete their programs and the officers are often elected in a hurry, when only a few are left in the meeting, and not enough attention is paid to their selection in reference to their geographical location, making it hard to communicate with each other, which is very liable at times to make the building of a program a slow process.

3. *State association meetings:* I recommend that there be some arrangement made by which it would be possible for at least all state association meetings to be attended by an official or representative of the American Veterinary Medical Association, so designated. This can be done with very little additional cost to our Association.

4. *Expulsion:* In our Constitution and By-laws there is no provision made for the expulsion from the membership of the A. V. M. A. of a member who has committed a felony. Therefore, I recommend that some provision be made in our Constitution and By-laws by which such a member may be expelled. This provision should give the Executive Board the power to do this at any one of its meetings.

I can not close this address without giving credit to all the officers who have so willingly assisted us during the past year, to all the men on the standing committees, as well as the men on the special committees, who also did wonderful work.

The resident state secretaries in most of the states did a wonderful piece of work in coming to this meeting with a larger number of new members than at any meeting for several years. It is gratifying to me, of course, that my own state should come to this meeting with a larger number of new members than any other state. This, let me assure you, is not due to any popularity of my own, but to the yeoman-like work of Ohio's Resident Secretary, Dr. D. M. Swinehart.

At a meeting of the Northwestern Ohio Veterinary Medical Association, at Findlay, when it was announced that Ohio

would go to the annual meeting with more new members than any other state, that Association voted unanimously to pay the expenses of sending Dr. Swinehart to this meeting, as a reward for this splendid piece of work. Let me suggest that this might be an inducement to other resident secretaries in the future.

It would surely be the height of ingratitude for me not to thank our capable and untiring Secretary for the wonderful cooperation he has given me during the year. I believe I have had a chance, better than any president this Association has ever had, to keep in close touch with our Secretary, being in very close proximity to his office and in all likelihood I have visited the office of the Secretary oftener than any other president has had the opportunity to do, thus being able to know his worth.

In conclusion I can only express the hope that our sixty-fifth annual meeting, held, as it is, in this great metropolis, whose name stands for energy and enthusiasm, will, as it now promises to do, surpass in point of interest and in number of those in attendance all previous gatherings of this Association, and that this organization shall continue to prosper until, with every eligible veterinarian enrolled in its membership, it becomes the great organization it deserves to be.

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### THE RIGHT OF A PROFIT

There is just one condition on which men can secure employment and a living, nourishing, profitable wage, for whatever they contribute to the enterprise, be it labor or capital, and that condition is that some one make a profit by it. That is the sound basis for the distribution of wealth and the only one. It can not be done by law, it can not be done by public ownership, it can not be done by socialism. When you deny the right of a profit you deny the right of a reward to thrift and industry.

—Calvin Coolidge.

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### VETERINARIANS VISIT EUROPE

Drs. William J. Lentz and H. C. Campbell, of the University of Pennsylvania Veterinary School faculty, accompanied by their families, sailed on the S. S. Pennland, on July 14, for a sojourn of two months in Europe. They planned to visit some of the most important veterinary schools and laboratories in a number of European countries.

## THE DANGER TO MAN OF BOVINE AND AVIAN TUBERCULOSIS\*

By C. H. MAYO, Rochester, Minn.

Tuberculosis as a scourge to mankind is one of the oldest of diseases, its beginning is buried in antiquity, and earliest reliable records indicate that it caused many deaths; and for many years in the recent past it was referred to as Captain of the Men of Death, because more people died of tuberculosis than of any other one disease. For a long time tuberculosis was thought to be an inherited disease and it was not known that we caught it one from another. Gradually it came to be recognized as a contagious disease and, about the middle of the last century, Villemin demonstrated by inoculation of material from the tubercles of tuberculous animals into rabbits that it was an infectious disease. Nearly twenty years later, in 1881, Koch proved it, after he discovered the germ, the tubercle bacillus that causes tuberculosis.

For many years, too, it had been known that cattle suffered from a similar disease and the tubercle bacillus was found in the tubercles in cattle.

Many physicians then came to think that man contracted tuberculosis from cattle. Some enthusiasts then believed that most human tuberculosis came from cattle and the danger of bovine tuberculosis to man was greatly exaggerated. Some students of tuberculosis had noticed that the germs obtained from human sources did not seem to be exactly the same as the germs obtained from cattle and, in 1898, Dr. Theobald Smith tabulated a series of these differences which seemed to indicate that the germs as found in the cattle were different from the germs found in humans and that one could tell by studying the germs whether they were cattle or human tubercle bacilli.

Koch carried this idea to an extreme when he declared, before the London Congress on Tuberculosis, in 1901, that the germs were not the same and that there was practically no danger of man contracting tuberculosis from cattle or about as much as there was danger to man from an inheritance of the disease, which of course means none at all, and he said that he did not deem it advisable to take any measures against it spreading

\*Presented at the sixty-fifth annual meeting of the American Veterinary Medical Association, Minneapolis, Minn., August 7-10, 1928.

from cattle to humans. Koch's opinions were based chiefly on clinical observations that, in Germany, intestinal tuberculosis was rare. Being a presumption that for bovine tuberculosis present in milk to cause tuberculosis in humans, it must be demonstrated as primary lesions in the intestinal tract, which, of course, is a wrong presumption. Primary lesions at the point of entry, either in the intestinal tract or the lungs, are very uncommon. Possibly the reason why intestinal tuberculosis is so rare in Germany is because more mothers nurse their babies or employ wet nurses, or they boil the milk.

Koch's views were immediately studied by many scientific workers, individually and collectively, all over the world. The German government authorized an investigation and the British government appointed a Royal Commission. The Pennsylvania State Live Stock Sanitary Board, the New York City Health Department and the officials of the U. S. Bureau of Animal Industry also carried on investigations. As a result, Koch's opinion as to the transmission of bovine tuberculosis to man has been fully disproved. But Koch's position in the scientific world was most outstanding because, of the many who were searching for it, he was the one who had discovered the tubercle bacillus. His opinions carried great weight and his words had a great influence on public opinion and they still have, and Koch's statements are the foundation today for a few scientists, some doctors and many lazy people who feel that we are exaggerating the menace of bovine tuberculosis to humans.

#### KOCH MINIMIZED DANGER OF BOVINE TUBERCULOSIS

As different scientists presented evidence and opinions contrary to Koch's, he came to modify his opinions, but he continued to his death to minimize the menace of bovine tuberculosis to humans. At the Sixth International Congress on Tuberculosis, at Washington, in 1908, when faced with almost unanimously contrary reports and opinions from other scientists, he opened the discussion on the relation of human and bovine tuberculosis by saying that "human beings may be infected by bovine tubercle bacilli, but serious diseases from this cause occur very rarely and preventive measures against tuberculosis should therefore be directed primarily against the propagation of human tubercle bacilli." To counteract the evidence of all the other authorities from every country, he mentioned the possible errors in research work and said that "the experiments carried on at the Kaiser-

liche Gesundheitsamt in Berlin are the only ones which fulfill in every way the foregoing experimental requirements. Those of the British Commission fail in several respects and all other work which has come to my notice answers these requirements so poorly that I can grant them no weight, at least as regards the occurrence of bovine tuberculosis in man." Apparently he thought no one knew how to investigate but himself. He referred to those who differed with him as opponents and said that "the few known cases in which bovine tuberculosis is said to have produced a general and fatally progressive tuberculosis in man appear to me not to be above suspicion." Apparently no one's results could be depended upon but his own.

In contradiction of Koch's opinions and in defense of their methods of investigation, the following spoke: Professor G. Sims Woodhead, Cambridge, England; Johannes Fibiger, of Copenhagen; M. P. Ravenel, of Madison, Wisconsin; Prof. Chas. W. Duval, Tulane University, New Orleans; Dr. Chas. F. Dawson, Newark, Delaware; and others. Koch finally declared that he had never denied that bovine tuberculosis is found in man and tried to narrow the discussion to a consideration of bovine tuberculosis in the lungs of humans. He asked whether "any case of pulmonary tuberculosis exists in which tubercle bacilli of the bovine type were found, not once but repeatedly." When Professor S. Arloing, of Lyons, France, Prof. G. Sims Woodhead, of Cambridge, England, and Prof. Fibiger, of Copenhagen, mentioned such cases, Koch again questioned the accuracy of their investigations and reports and finally concluded by saying:

I admit that bovine infection can occasionally occur, and I desire not to be understood as disregarding the endeavors to extirpate bovine tuberculosis, as far as these endeavors are dictated by agricultural and economic reasons. But I mean that it would be wrong to give to those proposals the leading place in front of the efforts to combat human tuberculosis.

Quite a modification of his position in London, in 1901, when he said:

I should estimate the extent of the infection by milk and by flesh of tuberculous cattle, and the butter made of this milk, as hardly greater than that of hereditary transmission, and I therefore do not deem it advisable to take any measures against it.

Koch's opinion as to the transmission of bovine tuberculosis to man was conclusively disproved by the final report of the British Royal Commission, presented after nine years of study and investigation, where it said:

We have investigated many instances of fatal tuberculosis in the human subject in which the disease was undoubtedly caused by a bacillus of the bovine type and by nothing else. Man must therefore be added to the list of animals notably susceptible to bovine tubercle bacilli.

And again:

We must conclude that mammals and man can be reciprocally infected with the disease (tuberculosis). The possible danger to man through reciprocity in this sense was, of course, the more important question presented to us, and as we have conclusively shown that many cases of fatal tuberculosis in the human subject have been produced by the bacillus known to cause the disease in cattle, the possibility of such infection cannot be denied.

And the importance of this conclusion is not diminished by the fact that the majority of such cases examined by us occurred in young children, or by the merely local results following the administration of the human type of bacillus to bovine animals. Bovine animals are not completely immune to the human tubercle bacillus, and adult human beings can be infected with the bovine type, even the pulmonary form of the disease in man being sometimes caused by the bovine tubercle bacillus.

And again:

So far as these 128 cases have been examples of tuberculosis in the adult, and especially when they have been cases of pulmonary tuberculosis, the lesions of the disease when fatal have been referable with few exceptions to human bacilli. Only rarely has a pulmonary lesion in adult man yielded the bovine bacillus. Our experience of abdominal tuberculosis in the human subject has been very different, especially as regards children. Of young children dying from primary abdominal tuberculosis, the fatal lesions could in nearly one-half of the cases be referred to the bovine bacillus and to that type alone. In children, too, and often also in adolescents suffering from cervical gland tuberculosis, a large proportion of the cases examined by us could be referred to the bovine tubercle bacillus. We have already in an earlier portion of this report referred to the importance of infection by the bovine type of tubercle bacillus in cases of lupus occurring in adolescents and children.

Whatever, therefore, may be the animal source of tuberculosis in adolescents and in adult man, there can be no doubt that a considerable proportion of the tuberculosis affecting children is of bovine origin, more particularly that which affects primarily the abdominal organs and the cervical glands. And, further, there can be no doubt that primary abdominal tuberculosis, as well as tuberculosis of the cervical glands, is commonly due to ingestion of tuberculous infective material.

And again:

We have found cases of tuberculosis in adult man, sufficiently extensive to incapacitate the patient for the ordinary duties of life and in two instances ending fatally, in which we were able to attribute the disease solely to the effects of the bovine tubercle bacillus. Though of the 56 cases of adolescent and adult tuberculosis which came under scrutiny no more than five yielded bacilli of the bovine type, we cannot say that this figure adequately represents the proportion of like cases obtaining among the tuberculous population generally.

Bovine tubercle bacilli are apt to be abundantly present in milk as sold to the public when there is tuberculous disease of the udder of the cow from which it was obtained. This fact is, we believe, generally recognized though not adequately guarded against. But these bacilli may also be present in the milk of tuberculous cows presenting no evidence whatever of disease of the udder, even when examined postmortem. Further, the milk of tuberculous cows not containing bacilli, as it leaves the udder may, and frequently does, become infective by being contaminated with the feces or uterine discharges of such diseased animal. We are con-

vinced that measures for securing the prevention of ingestion of living tubercle bacilli with milk would greatly reduce the number of cases of abdominal and cervical gland tuberculosis in children, and that such measures should include the exclusion from the food supply of the milk of the recognizably tuberculous cow, irrespective of the site of the disease, whether in the udder or in the internal organs.

In view of such a report which was practically duplicated almost unanimously by research workers in Germany, France, Denmark, the United States and other parts of the world, one would think the question of the menace of bovine tuberculosis to humans was settled nearly twenty years ago. But so great was Koch in the world of tuberculosis research and study that some of his followers continued to carry on the fight in support of his opinions and to this day opponents of the fight to eradicate bovine tuberculosis quote Koch's old arguments in spite of the fact that they have been so many times conclusively disproven. Unfortunately some of the laymen who are personally interested or, having committed themselves in exaggerated statements like Koch's, continue to defend them to the last, discounting all evidence which would disprove their contentions.

At the International Congress on Tuberculosis in Rome, in 1912, the question was keenly discussed and the special conference drew up the following resolutions, which were subsequently accepted by the International Congress as a whole. The text of the resolutions ran as follows:

- (1) The prophylaxis against tuberculosis must principally be directed against the suppression of contamination from man to man, and especially in the family; (2) contamination of man by bovine infection is of less frequency. Nevertheless it is necessary to maintain all measures against infection of bovine origin.

It is of course advisable to endeavor to find out how frequently bovine tuberculosis occurs in humans. After studying reports and statistics from all parts of the civilized world, I am satisfied a conservative estimate of the danger of bovine tuberculosis to humans would be that 25 per cent of tuberculosis in children and 5 per cent of all tuberculosis in humans is due to infection with the bovine germs, which, in the majority of instances, were received through the consumption of tuberculous milk. Bovine tuberculosis sometimes causes lung tuberculosis in humans, but usually it causes the other forms, such as in the bones and joints, glands in the neck, chest, and abdomen, the membranes of the brain and spinal cord and generalized miliary tuberculosis.

In Minnesota, in sixteen years from 1910 to 1925, there were 34,570 people who died of tuberculosis and 6,343 of those died of other forms than lung tuberculosis. On a basis of 5 per cent

of the total, this would mean that 108 people died here, every year, of bovine tuberculosis. It has been estimated that  $\frac{1}{2}$  of 1 per cent of lung tuberculosis and 10 per cent of other forms of tuberculosis in humans is caused by the cattle germ. Figuring on that basis then, 48 people died here every year of bovine tuberculosis. If we accept this lowest estimate of 48 annual deaths, in addition to the hundreds of cases of bovine infection which does not kill, but results in crippling and incapacitating for a long period or the rest of life, I am sure we are justified in all our efforts to eradicate bovine tuberculosis.

Dr. L. Van Es, of the University of Nebraska, has lately done some extensive investigations, which he is still carrying on, with tuberculous material obtained mostly from our clinic and he has already found that bovine tuberculosis occurred in four of them.

These figures and estimates will of course vary in different localities, states and countries, depending first on the amount of tuberculosis in their cattle originally and on the amount of effort being made to eradicate it by tuberculin-testing, and secondly on their protection through pasteurizing milk. It will be lower in the South and higher in the East and much higher in European countries, especially in England and Scotland, where very little tuberculin-testing has been done and where very little of the milk is pasteurized.

Harold J. Stiles, surgeon of the Royal Edinburgh Hospital for Sick Children, at the International Congress of Medicine in London, in 1913, said:

The investigations which have been carried on by my assistants, Mr. John Fraser and Dr. A. P. Mitchell, from the material derived from the Royal Edinburgh Hospital for Sick Children, if confirmed by other observers, show that in Scotland at any rate, the bovine bacillus is a more frequent cause of those forms of surgical tuberculosis in children which we are now considering, namely, tuberculosis of the bones and joints and lymphatic glands, than is the human bacillus.

Next, when we turn to the postmortem records obtained from the children's hospitals in this country, we find, according to the statistics of Shennen, Still, Coutta, and others, that in about 25 per cent of the children in whom tuberculous lesions are found at the postmortem, infection had taken place through the alimentary tract.

My own clinical experience derived from the large amount of surgical tuberculosis met with in the Royal Edinburgh Hospital for Sick Children led me to the conclusion that the bovine bacillus was responsible for far more surgical tuberculosis in this country than the findings of the Royal Commission, the German Commission, and all the results published by other workers, would lead us to suppose.

It occurred to me that the wealth of material derived from my operations on bone and joint and gland cases at the Royal Edinburgh Hospital for Sick Children might be utilized with advantage to determine the relative frequency of human and bovine infections in these forms of tuber-

culosis. Mr. John Fraser, now assistant surgeon to the hospital, undertook the research as regards the bone and joint cases.

Of the 70 cases investigated, 39 were cases of joint disease, and 31 of bone disease. Of the 70 cases the bovine bacillus was present in 41, the human bacillus in 26, and both types in 3. As regards the age incidence, all the patients but 3 were under 12 years of age. It is interesting to note that in each of the 3 adults, the bacillus was of the human type. Forty-one of the children were under 4 years of age, and of these in no less than 78 per cent the disease was due to the bovine bacillus. The milk history was also carefully inquired into, and it was observed that the bovine bacillus was the organism found in all the children less than twelve months old, and that each of these had been entirely nourished upon cow's milk. Of the twelve children between one and two years of age, eight owed the disease to the bovine bacillus, and every one of these had been brought up from birth on cow's milk. It was interesting to note, too, that in none of the children artificially fed had the milk been sterilized.

My present assistant, Dr. A. F. Mitchell, who was formerly my house surgeon at the Children's Hospital, has for the past two years been working at the etiology of tuberculous affections of the cervical glands. He has investigated 72 consecutive cases of tuberculous cervical glands operated on at the Royal Edinburgh Hospital for Sick Children.

Of the 72 cases it was found that 65, i. e., no less than 90 per cent contained the bovine bacillus, while only 7 (10 per cent) contained the human bacillus. I may here mention that Dr. Mitchell also investigated 8 adult cases, 6 of which contained the bovine bacillus and 2 the human bacillus.

I desire to draw special attention to the fact that Dr. Mitchell's results give a far larger proportion of bovine infections than has been found by other observers. The great value of his results lies in the fact that they have been obtained from a consecutive series of cases derived from one institution. Moreover, by going carefully into his records of the cases, he has been able to correlate his pathological findings with the clinical histories, and he has found that these have afforded a sufficient explanation for the very large proportion of bovine infections.

Of the 72 cases no less than 36 occurred in children under 5 years of age, and of these all but 3 were bovine infections. The maximum incidence occurred during the second year, and it is interesting to note that Dr. Mitchell found that 84 per cent of the children under two years of age had been brought up since birth on raw cows' milk.

With regard to the history of tuberculosis in other members of the family, it was found that out of 65 children infected with the bovine bacillus, there was not a single case in which a history of pulmonary tuberculosis could be obtained in the family.

The supposition is that in each of these families the children acquired the tuberculous disease from an infected milk supply. In the 72 cases there were only three instances in which a history of pulmonary tuberculosis could be obtained in the parents, and it is interesting to note that in each of these three cases it was the human bacillus which was isolated from the cervical glands.

The World War interrupted research work and investigations on the subject and since then the majority of the reports of such have come from Great Britain and show that the percentage of bovine infection remains high.

Present knowledge on this subject was summarized by Dr. A. Stanley Griffith, in his paper read before the National Milk Conference (London, 1922). In the course of his remarks he gave details in regards to 1,215 English and Scottish cases, in

which the type of tubercle bacillus had been determined by identical methods employed for demonstrating the differential characteristics of the infecting tubercle bacilli. He showed that, of the total number, 935 (77 per cent) were of human origin, and 280 (23 per cent) were of bovine origin. Dr. Griffith showed separate tables in respect of different varieties of human tuberculosis from which I have prepared the following table:

TABLE I—*Proportion of bovine to human infection in the different varieties of human tuberculosis, compiled from tables given by A. Stanley Griffith, at the National Milk Conference (London, 1922)*

	NUMBER OF CASES	HUMAN	BOVINE	PERCENTAGE BOVINE
(1) Cervical gland tuberculosis . . . . .	116	62	54	46.5
(2) Bone and Joint tuberculosis:				
(a) England and Wales . . . . .	476	389	87	18.3
(b) Scotland . . . . .	28	20	8	28.6
(3) Lupus . . . . .	126	62	64	50.8
(4) Scrofuloderma . . . . .	52	32	20	38.4
(5) Genito-urinary tuberculosis . . . . .	17	14	3	17.6
(6) Examination of postmortem material from children:				
(a) Local Government Board series . . . . .	113	93	20	17.7
(b) Royal Commission series . . . . .	46	27	19	41.3
(7) Tuberculous meningitis . . . . .	12	10	2	16.6
(8) Pulmonary tuberculosis . . . . .	229	226	3	1.31
Totals . . . . .	1215	935	280	23.05

Dr. Griffith stated amongst his conclusions:

Bovine tuberculosis is an important source of human tuberculosis in Great Britain. The bovine tubercle bacillus shares in the production of all the chief clinical varieties of human tuberculosis and causes an appreciable loss of life, especially in childhood. The proportion of bovine to human infections is highest in children under five years of age, and in those forms of tuberculosis which are primary in the alimentary tract.

The age incidence and the anatomical distribution of the primary lesions clearly point to cow's milk as the source of the infection with bovine bacilli.

Cow's milk containing living tubercle bacilli ought not therefore to be used for human consumption, and stringent measures should be taken to prevent the sale of such milk.

It is estimated by Cobbett, from the above data, that the bovine type of bacillus causes about 6.44 per cent of the total deaths from tuberculosis of all kinds in England and Wales, or approximately 3,000 deaths every year.

In addition to the estimated 3,000 who die, the number of people who do not die but who suffer for a long period, perhaps throughout life, from tuberculosis as a result of drinking infected milk, is very much higher.

It is interesting to note that the percentage of bovine infection in pulmonary tuberculosis in humans (1.3 per cent) is much

higher in England and Wales than in other countries reporting.

More recently Dr. A. S. Griffith read a paper entitled, "Tuberculosis of bovine origin in the human subject," at the Eleventh National Conference on Maternity and Infant Welfare, held in London, July 5-7, 1927. It deals with 541 cases of bone and joint tuberculosis, with the result that 18.7 per cent of them were found to be caused by tubercle bacilli of the bovine type. This percentage refers to patients of all ages; if one takes only children under five years of age (102 cases), the percentage so infected naturally rises and here it is 30 per cent. Under ten years (327 cases) it is 25 per cent.

One might go on indefinitely quoting statistics from recognized authorities. Today no recognized authorities and few physicians doubt the transmissibility of bovine tuberculosis to humans, but there are still some who minimize the danger even to the extent of opposing the efforts of those who are endeavoring to eradicate the disease from cattle on the ground that the menace is so slight as not to constitute a public health problem. I am satisfied that the figures I have quoted prove conclusively that the danger of bovine tuberculosis to man is quite sufficient to justify all the effort and all the expenditure to eradicate the disease from cattle and to justify me as Health Officer at Rochester in insisting that all the milk used in Rochester must be from cows negative to the tuberculin test, whether the milk is to be pasteurized or not.

#### ALL REACTORS SHOULD BE REMOVED

I am of the opinion that no cow with tuberculosis should be tolerated in the milk supply. The difficulty is to know the ones that have tuberculosis. There is no absolutely certain way of telling. The best way is to test the cattle with tuberculin and consider all those that react as potentially dangerous. The tuberculin test is not 100 per cent perfect but it is by far the best method we have of determining those cattle that are tuberculous and all reactors should be removed from the milk supply to ensure safety. Occasionally a cow with gross general tuberculosis does not react to the tuberculin test, but generally such can be discovered by the veterinarian's examination made at the time, as such animals usually look badly, are evidently sick, non-breeders and an economic loss. This is just like humans, with gross chronic lesions, who fail to react, having so much of their own or they are recovering from temporary exacerbations.

In addition to minimizing the frequency of bovine tuberculosis in humans, those who would let down the bars against tuberculous cattle in the milk supply contend that it is only when there are gross lesions in the udder that there is a possibility of the disease spreading through the milk to man and they say that only cows with gross udder lesions of tuberculosis should be excluded from the milk supply. Such a contention is not correct.

In addition to the fact that udder lesions may develop in a tuberculous cow after an examination has been made, it has been proven that a tuberculous cow may excrete tubercle bacilli in its milk without having any demonstrable lesions in the udder. Furthermore, it has also been proven that a cow with lung tuberculosis, which is much more common than udder tuberculosis, will cough up and swallow and pass in its dung the tubercle bacilli which get into the milk from the air, the dust, and the cow itself.

In discussing this question, Mitchell, of Edinburgh, says:

The important practical point to consider is the extent to which tuberculous cows yield tubercle bacilli in the milk. Until a few years ago it was a commonly accepted view that tubercle bacilli were only found in milk when the udder was affected. As a result of the experimental work of Schroeder in America, and more recently that of the last Royal Commission on Tuberculosis in this country, we now know this not to be the case. Their results prove indisputably that tubercle bacilli may and do gain access to milk from cows which clinically show no signs of udder tuberculosis, or indeed, any form of tuberculosis.

The very absence of any definite sign in the earlier stage (of udder disease) is one of the greatest dangers of this condition. According to Delepine it is practically impossible for the veterinary surgeon unaided to discover by ordinary inspection early tuberculous lesions of the udder.

Dr. E. C. Schroeder, referred to by Dr. Mitchell, reported, at the Sixth International Congress on Tuberculosis at Washington, as follows:

Tests, made at the experiment station of the United States Bureau of Animal Industry, demonstrated that many seemingly healthy tuberculous cattle expel virulent tubercle bacilli from their bodies per rectum with their feces.

Cows were collected from several dairy herds and kept under observation about two years. They were in excellent general condition and had no visible symptoms of disease; they were not known or suspected to be tuberculous until they were tested with tuberculin, and prior to their removal from the dairy herds to which they originally belonged their milk was regularly sold to city consumers.

During the first two months microscopical examinations revealed that 41 2/3 per cent of the cows were intermittently expelling acid-fast bacilli per rectum; eighteen months later the number had increased to 10, or 83 1/3 per cent; that is, it had doubled, though the majority of the cows still retained their apparently good condition and showed no symptoms of tuberculosis.

The various facts presented clearly seem to justify the following conclusions:

1. Tuberculous cows, wholly free from visible symptoms of tuberculosis, frequently expel tubercle bacilli from their bodies per rectum.
2. Tubercle bacilli in the feces of tuberculous cows are not dependent upon intestinal tuberculosis, but commonly have their origin in the lung.
5. Since the feces of cattle are a common, almost universal impurity in milk, the presence of tubercle bacilli in the feces of tuberculous cows makes it practically impossible to obtain milk at all times free from tubercle bacilli, either from tuberculous cows or in the environment of tuberculous cattle.

Now, let us bear in mind that from 15 to 30 per cent of our dairy cows are affected with tuberculosis; that the examination of over 300 samples of milk from the local market showed that 5½ per cent, or 1 in 18, contained virulent tubercle bacilli, notwithstanding that the best available data indicate that the tuberculous condition of the local dairy herds is not as bad as that of the herds supplying milk to most other Eastern cities of the United States, and certainly not as bad as the condition of the herds from which European cities obtain their dairy products, and it will become evident that the tuberculous cow is, by herself, a sufficient source of virulent bacilli to account for the infection of the whole human race.

Extracts of the report of the British Royal Commission on tuberculosis referred to by Mitchell follow:

The third interim report of the Royal Commission on Tuberculosis is devoted to the investigations of Dr. F. Griffith, on the presence of tubercle bacilli in the milk and feces of cows not showing any signs of disease of the udder during life.

The feces and the milk of naturally tuberculous cattle have been tested by means of inoculation and feeding experiments upon animals. Observations have been made on six milch cows. Three of the animals showed clinical evidence of tuberculosis, but in none of the six could any tuberculous disease of the udder be detected during life.

The experiments which we have carried out with regard to the infectivity of the feces of tuberculous cows were dictated by knowledge of the fact that dirt of various kinds from cows and the cowshed is almost constantly present in milk as it reaches the consumer. Cows suffering from extensive tuberculosis of the lungs must discharge considerable numbers of bacilli from the air passages in the act of coughing, and some of the bacilli thus expelled may find their way into the milk. But our experiments indicate that the excretion of cows obviously suffering from tuberculosis of the lungs or alimentary canal must be regarded as much more dangerous than the matter discharged from the mouth or nostrils. We have found that even in the case of cows with slight tuberculous lesions tubercle bacilli in small numbers are discharged in the feces, while, as regards cows clinically tuberculous, our experiments show that the feces contain large numbers of living and virulent tubercle bacilli.

Three cows manifestly diseased all showed tuberculosis in both feces and milk. In three cows, positive reactors not manifestly diseased, two showed tuberculosis in feces, none proven in milk.

In 1899 Rabinowitch and Kempner published an important investigation on the milk of cows reacting to tuberculin. They examined the milk of fourteen animals, only one of which exhibited disease of the udder manifest by physical examination; but in ten out of these fourteen they succeeded in proving that

tubercle bacilli were present in the milk which the animals yielded.

In 1907 Dr. J. R. Mohler, then chief of the Pathological Division of the U. S. Bureau of Animal Industry, reviewing the evidence which had been accumulated on this subject, wrote as follows:

That milk coming from a tuberculous udder is capable of transmitting the infectious principle is conceded by all who have given the subject any consideration. It has been equally established that in advanced generalized tuberculosis, the udder may secrete tubercle bacilli without showing any indication of being affected. Careful experiments performed by trained and eminently responsible investigators have also demonstrated beyond reasonable doubt that tubercle bacilli at certain times may be present in the milk of cows affected with tuberculosis to a degree that can be detected only by the tuberculin test, so that in a herd of cows in the various states of tuberculosis it is to be expected that some of them will secrete tuberculous milk, which, when mixed with other cows' milk, makes the entire product dangerous.

How frequently market milk is infected by tuberculosis germs will of course vary in different cities, states and countries, depending on the amount of tuberculosis present in the cows supplying the milk.

Miller (*Edinburgh Medical Journal* (1914) xii, p. 156) gives the result of an investigation of 101 samples purchased from milk shops distributed in different parts of the city, and of these sixteen were found to contain living tubercle bacilli. Similarly, Mitchell (*Edinburgh Medical Journal* (1914) xii, p. 315), investigating 201 samples from certain districts of the city, found tubercle bacilli in 41 of these (20 per cent).

We read in Klein's "Principles and Practice of Milk Hygiene," as follows:

#### The Frequency of Tubercle Bacilli in Market Milk.

Anderson examined 253 samples in Washington in 1906 and found tubercle bacilli in 6.72 per cent. In Philadelphia, in 1908, Campbell examined 130 samples of raw milk and found tubercle bacilli in 13.8 per cent; twelve samples of milk sold as "pasteurized" were also examined by him and one sample, or 8.3 per cent, contained virulent tubercle bacilli. Hess found tubercle bacilli in 16 per cent of the samples he examined in New York in 1909, and of 144 samples examined by Tonney of Chicago in 1910, 10.5 per cent were infected with tubercle bacilli.

Heinemann, in his book, "Milk," says:

Probably in all municipalities where raw milk is sold some of it is infected with tubercle bacilli.

It has been estimated that about 40 per cent of tuberculous cattle, which give no outward indication of the disease, discharge tubercle bacilli with their excreta.

Since tubercle bacilli are discharged in large numbers with feces, it follows that market milk is frequently contaminated with them.

Investigators in various cities have given the percentage of market milk containing tubercle bacilli at 5-17, and even higher. A conservative estimate might place the average at 6-8 per cent.

Today a large percentage of human tuberculosis is cured or at least arrested. By using Bang's method or some similar care of cows with tuberculosis, the disease may be arrested in them too. To carry out such a plan on an ordinary farm with even high-priced cattle in this country is hardly commercially possible. This also accounts for the fact that but few cows die of tuberculosis because they are sold for butchering, as the large proportion of them have intestinal or glandular tuberculosis which does not prevent their use for meat in this country. Carcasses badly diseased are of course not used for meat but are sent to the tanks.

Regarding the danger to man of avian tuberculosis the evidence is not so conclusive. Although it is often demonstrated that the human being is infected with bovine tuberculosis, the avian type is very rarely found in man. I have had two patients at the Clinic in whom avian tuberculosis was demonstrated surgically and pathologically.

Von Kurt Lederer has reported a case, and Loewenstein cites two cases, in which avian tuberculosis occurred in poultry-breeders and in 1913 he expressed the opinion that avian tuberculosis is more common in man than had been theretofore accepted.

Pansini expressed the opinion that such infection actually occurs and Nocard encountered avian bacilli in human lesions.

Recently Plum, of Copenhagen, has published a monograph reporting cases of avian tuberculosis discovered in humans by several observers.

That the bacillus of avian tuberculosis is pathogenic for man is further corroborated by Rabinowitch and Lipschultz.

Dr. Gilbert J. Thomas and Dr. Frank L. Jennings, of Minneapolis, report having found evidence of avian infection in some kidney cases.

Dr. James B. Murphy, of the Rockefeller Institute, claims he is finding avian infection in some cases of Hodgkin's disease. Dr. Van Es, of the University of Nebraska, found acid-fast bacilli in material from a case of Hodgkin's disease and his investigation of the case is still going. Dr. Van Es has done considerable investigation of this subject and has reported:

The very common transmission of the infection to swine already has been shown to be a source of enormous losses; and the fact that tuberculosis of avian origin has also been found to exist in cattle, certainly points to the possibility of it being at least a disturbing factor in the eradication technic now being followed in the bovine disease.

It is probably rare as a cause of tuberculosis in man in this country, but European investigators have described a number of cases. Typing experiments with human material, now under way at the Nebraska Experiment Station, have thus far not yielded any evidence of avian infection, but the investigation is far from complete at this time.

On another occasion Van Es has written:

After reviewing the evidence it becomes apparent that many strains of avian bacilli are actually pathogenic to mammals, but to a considerably less extent than the organisms associated with spontaneous mammalian disease.

With the possible exception of swine, the danger to mammals from avian infection sources is probably very slight and negligible. We do not know, however, how soon an avian organism in a mammal may become adapted to its new surroundings and become capable of producing mammalian disease with regularity. Such a possibility is indicated by the results obtained by Bang; and Cadiot, Gilbert and Roger.

In view of the possible source of danger, however slight it may be, it is apparent that prudence demands that fowl tuberculosis be so managed as to prevent its transmission to other farm stock.

And again, says Van Es:

It is not possible to eradicate tuberculosis completely from one species without eradicating it also from the others. In the tuberculosis of cattle and of poultry this may be somewhat of a hypothesis, but in the disease of swine it is a reality resting upon solid ground. Just as long as we have bovine, avian, and human tuberculosis, there will be tuberculosis of swine for the same reason that the elimination of human tuberculosis can never be complete as long as bovine infection remains as a real or potential source of mischief.

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### BUREAU TRANSFERS

Dr. Daniel J. Bynacker (U. S. C. V. S. '13), from New Orleans, La., to Newark, N. J., on meat inspection.

Dr. Wm. Poseiner, Jr. (Cin. '13), from Newark, N. J., to Cincinnati, Ohio, on meat inspection.

Dr. Herbert C. Berger (Cin. '17), from Cincinnati, Ohio, to Jackson, Miss., on tick eradication.

Dr. Herman F. Arndt (McK. '14), from Chicago, Ill., to Madison, Wis., on meat inspection.

Dr. Grover C. Pieper, from Cairo, Ill., to Baltimore, Md., on meat inspection.

Dr. Chester N. Dale, Jr. (O. S. U. '19), from Chicago, Ill., to Bethesda, Md.

Dr. J. A. Wilkinson (U. P. '07), from Fort Worth, Texas, on tick eradication, to Fort Worth, Texas, on meat inspection.

Dr. Wm. G. Hart, from Fort Worth, Texas, to Chicago, Ill., on meat inspection.

Dr. Henry A. Taggart (K. C. V. C. '15), from Jacksonville, Fla., to Jackson, Miss., on tick eradication.

Dr. Edgar Heiny (Ind. '08), from Jacksonville, Fla., to Jackson, Miss., on tick eradication.

Dr. Joseph B. Schorfheide, from Madison, Wis., to Chicago, Ill., on meat inspection.

Dr. Elvon S. Dickey (K. C. V. C. '06), from Milwaukee, Wis., to Sioux City, Iowa, in charge of meat inspection.

Dr. Albert E. Behnke (Chi. '92), from Sioux City, Iowa, to Milwaukee, Wis., in charge of meat inspection.

Dr. Merwin L. Crans (K. C. V. C. '16), from Toledo, Ohio, to Philadelphia, Pa., on meat inspection.

Dr. Hubert Bunyea (U. S. C. V. S. '18), from Washington, D. C., to Bethesda, Md.

## THE RELATIONSHIP BETWEEN THE COLOR AND THE FAT CONTENT OF BOVINE CORPORA LUTEA\*

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### HISTORICAL INTRODUCTION

The color of bovine corpora lutea is due to the presence of a pigment which several investigators have proved to be carotin, the same pigment which is present in the roots of carrots, from which the name is derived. Palmer,<sup>1</sup> in his monograph, "Carotinoids and Related Pigments," gives a complete résumé of the history of this pigment. He speaks of the work of Thudichum who, in 1869, attempted to classify the yellow, red and orange pigments of both plants and animals. He grouped all of the yellow pigments from animal sources into one group, giving them the name "Luteins." In this group he included the pigment of the corpus luteum, the yellow pigment of blood-serum, of adipose tissue and butter, and of the yolk of eggs. His reason for so grouping them was because they appeared to have certain characteristics in common. It is now known that his "luteins" included several different pigments and that the characters, which he thought were common to all, applied only to certain pigments of the group. Palmer deplores the use of the name "luteins," as used by Thudichum, as this term should be used only in connection with the pigment of the corpus luteum and should not be applied to such pigment as that of the yolk of eggs which "can in no way be related to the corpus luteum." He has shown that this pigment is identical with one of the plant pigments, xanthophyll.

Palmer further reports that carotin, the pigment from the roots of carrots, was the first vegetable pigment to be discovered and also the first chromolipoid of mammalian origin to have been isolated. He refers to the work of Piccolo and Luben who, in 1866, isolated carotin from the corpora lutea of cattle and to that of Holm, who also isolated it in 1867. Of Holm's work Palmer writes as follows:

It is gratifying to note how accurately Holm described the crystalline form, the color of the crystals, both alone and when dissolved in various solvents, and the characteristic blue color reaction with nitric acid, all of which later helped to identify the pigment as carotin.

\*Thesis presented as part of the requirements for the degree of Master of Science, Ohio State University, 1927.  
Research Paper No. 74, Journal Series, University of Arkansas.

Palmer speaks of the work of Capranica who, in 1871, also isolated carotin from cows' ovaries and obtained it in crystalline form. Because this pigment so closely resembled that of the yolk of eggs and that of the retina of the eye he regarded them as being identical. Capranica observed that the pigment of the corpus luteum was soluble in petroleum ether and in carbon disulphid. It is by the use of these solvents that the pigment of the corpus luteum and that of the yolk of eggs can be differentiated. Palmer says that, in 1878, Kühne first concluded that these two pigments were not identical. This was not known to be true until 1913, when Escher<sup>2</sup> proved the pigment of the corpus luteum to be carotin.

Escher, in 1913, collected 146 kg. of ovaries from cattle and sheep and by the use of petroleum ether extracted 0.45 gm. of pure carotin from them. His technic of isolation is given in detail by Palmer. In concluding his original article, Escher says that the 0.45 gm. of carotin which he isolated was undoubtedly only a small portion of the carotin which was present. Escher made a careful comparison between the carotin which he obtained, with pure carotin from another source, in molecular weights, melting point, and the ease with which each was dissolved in various solvents, and found them to be identical.

Thatcher<sup>3</sup> gives the following characteristics for carotin. It occurs in crystalline and amorphous forms in many plants. The crystals are in the form of flat plates which are orange red by transmitted light and greenish blue by reflected light; its melting point is 168° C. Carotin is insoluble in water, slightly in cold alcohol or acetone, readily soluble in petroleum ether, ether, chloroform, and carbon disulphid. Solutions are strongly fluorescent. The chemical formula is  $C_{40} H_{56}$ , a hydrocarbon.

That the yellow pigment of corpora lutea consists of carotin has not been proved to be true except in the case of cows and ewes. Palmer<sup>1</sup> says that the pigment of human corpora lutea is probably a mixture of carotin and xanthophyll, and in the horse it is probably carotin. He has not been able to identify it in corpora lutea of swine and he refers to the work of Bergh, Miller and Brochmeyer who, in 1920 failed to isolate carotin from corpora lutea of these animals.

That the quantity and quality of lipoid and fat in corpora lutea of bovine ovaries vary, depending upon the stage of gestation, was observed by Tricomi,<sup>4</sup> in 1921. He made a series of observations on the quality and quantity of fat present in

bovine corpora lutea of animals killed in different stages of gestation. He found that from the time of the formation of the corpus luteum up to the fifth month the amount of fat increases, then it decreases for a time, to increase again from the seventh month on. He found that the fat is nearly all lipoid for the first two months but that the lipoid did not increase as the amount of neutral fat increased but decreased from the third month until at the termination of pregnancy, when it had almost entirely disappeared.

Von Mikulicz-Radecki<sup>4</sup> found that the quantity and quality of lipoids in human corpora lutea also underwent important changes during the period of gestation. It was found that as long as the cells function, lipoids containing nitrogen and phosphorus are present; cholesterol and cephalin were identified. The first symptom of degeneration that was observed was the appearance of neutral fats. These were found to increase gradually until finally only neutral fats, fatty acids, and soaps were found. According to this source the complex lipoids, phosphatids, cerebrocides, and cholesterol are hormones produced by the lutein cells.

Fenger<sup>5</sup> also found bovine corpora lutea to be rich in phosphatids. He found them to contain fifteen times as much as normal muscle, with which he made comparison.

McNutt<sup>7</sup> reports on the corpora lutea of nineteen non-pregnant cows and heifers which were killed at varying definite times following the onset of estrus. This investigator made studies on the origin, development, and retrogression of lutein cells and fats of the corpus luteum; the following is a brief review of his conclusions: The corpus luteum of the ox develops from the cells of the theca interna and from those of the granulosa. Soon after ovulation the theca externa contracts, throwing the theca interna and granulosa into folds. In the deeper folds the theca interna thus projects toward the center of the follicular cavity. This folding facilitates the vascularization of the granulosa and the ingrowth of connective tissue into the developing corpus luteum. At the beginning of the development of the corpus luteum the lutein cells developing from the theca interna and those developing from the granulosa contain varying numbers of lipoid granules, the theca cells containing more than those of the granulosa. As the development of the corpus luteum continues, the cells of the granulosa take on more lipoid until on the seventh day after heat when they may be found to con-

tain far more lipoid than the lutein cells developing from the theca interna. On the fourteenth day following the period of estrum, the lipoid content of the various lutein cells has increased considerably, the granules in some of the granulosa cells having coalesced to form large inclusions. This probably is the first evidence of involutionary change. Nineteen days after heat, some of the granulosa cells are almost free from lipoid granules, some have small granules in varying numbers while still others have large granules throughout the endoplasm, probably indicating an involutionary stage. The lutein cells developing from the theca interna as a rule contained less lipoid granules than those developing from the granulosa. Occasionally, however, a theca cell contained a mass of large granules. The amount of lipoid content increases up to about twenty-four days after heat, but from then on becomes less and less.

McNutt concluded that there is a distinct relationship between the amount of pigment in bovine ovaries and the amount of fat present, and the following statements present his observations regarding color changes in corpora lutea. The color of the corpus luteum of estrum passes through definite color changes from its formation after ovulation to its degeneration at the end of the twenty-one day period. The very young corpus luteum presents a light brown or brownish-yellow color, except in those cases where there has been marked extravasation of erythrocytes into the granulosa, when it is red. The brownish tinge is gradually lost until by the seventh day the color has changed to an "old gold"; by the fourteenth day it has become a bright golden yellow and by the twentieth day the color has changed to a true orange. As involution progresses the color gradually deepens, ultimately changing to a red, as found in vestiges of corpora lutea. Regarding this point, McNutt says:

By sectioning a red body with the freezing microtome and examining it immediately, irregularly shaped and sized red granules will be seen.

Finally, McNutt concludes that the pigment of corpora lutea is closely associated with their lipoid content. He found that the pigment of the red vestiges was slowly soluble in alcohol while that of the yellow corpora lutea is readily soluble; the red pigment however, is readily soluble in ether, chloroform, xylol and benzene.

Elder,<sup>8</sup> in 1925, in making a detailed microscopic study of bovine corpora lutea from pregnant and non-pregnant animals, found that the corpus luteum of estrum and that of pregnancy

undergoes fatty degeneration at the end of the 21-day period and at the termination of pregnancy, respectively.

#### SIZES AND SHAPES OF BOVINE OVARIES. CYSTIC OVARIES

This study sought to determine if there is any relation between the color of bovine corpora lutea and their fat content and represents data gathered from 194 animals of all ages, from heifers that had just reached breeding age up to aged cows, both non-pregnant and in all stages of gestation. One animal carried a fetus slightly more than 1 cm. in length and several were evidently in the last month of pregnancy.

To obtain the material for study the abattoir was visited and the ovaries and uteri obtained directly from the animals on the killing-floor. Each uterus was incised in order to determine if the animal was pregnant or not and if found pregnant the stage of gestation was estimated by the size and development of the fetus. During the first part of the study the breed of the animal was not observed. Later, on the supposition that possibly the color of the corpus luteum might be a breed characteristic, much as the yellow color of the skin of Guernsey cattle is characteristic of the breed, the breed of the animal from which the ovaries were obtained was recorded.

This method of collecting the material for study did not make it possible to obtain the history of the animals from which the ovaries were obtained. That the history of the animals would have been desirable and of considerable interest is shown by data obtained from some of the ovaries. For instance, animal 12, a non-pregnant cow, had one normal ovary which contained a corpus luteum, 22 mm. by 18 mm. in size, color V (chart I), which was undergoing cystic degeneration, two vestiges, one 9 mm. by 5 mm., which was distinctly red, the other being smaller but of the same color, and also a large almost matured graafian follicle. Paired with this ovary, a testicle was found (fig. 1). The testicle was small, measuring, after being hardened, 25 mm. by 19 mm. and of the consistency of the testicle of a cryptorchid horse. A complete history of this animal would have been very interesting.

Of the 194 pairs of ovaries collected, nine showed cystic degeneration of the corpus luteum. That of animal 22 contained a cystic corpus luteum; the cyst was 20 mm. in diameter, and its walls consisted of the peripheral remnants of the corpus luteum, being 1-1.5 mm. in thickness. The ovary of animal 178 con-

tained two corpora lutea, one of which was cystic. The cyst measured 12 mm. in diameter, with wall of corpus tissue not more than 1 mm. in thickness. The ovary of animal 169 contained a corpus luteum which showed a blood clot at its center, 3 mm. in diameter. The ovaries of animal 188 were very unusual. One showed two corpora lutea of about equal size, 10-12 mm., both IX in color. The other ovary contained another corpus luteum which was 14 mm. in diameter and X in color, showing deposits of black pigment.

The ovaries studied showed considerable variation in shape and size. In some almost the entire ovary consisted of corpus luteum, in which case the ovary would be roughly spherical in



FIG. 1. Ovary and testicle obtained from animal 12.

shape. In others the ovary was nearly the shape of an isosceles triangle, the corpus luteum making up the apex. In others it was found to be roughly the shape of a right angle triangle. There appeared to be no relation between the shape of the ovary and whether the animal was pregnant or not. However, the ovaries from the pregnant animals were slightly larger than those from non-pregnant animals. The average size of the ovaries from 119 pregnant cows and heifers was 34.9 mm. by 24.87 mm. while the ovaries from 65 non-pregnant animals averaged 33.35 mm. by 23.41 mm. This slight difference is probably of no particular significance.

The size and shape of the corpora lutea also varied considerably. Those from pregnant animals were slightly larger than

those from non-pregnant animals. The average size of the corpora lutea from 115 pregnant animals was found to be 21.82 mm. by 19.51 mm., while those from 54 non-pregnant animals averaged 20.07 mm. by 17.80 mm. Elder also found that the corpora lutea from pregnant cows were slightly larger than those from non-pregnant animals. His corpora lutea from pregnant animals averaged 19.3 mm. by 16 mm. Our work agrees very closely with his. The corpora lutea from pregnant animals encountered in this study averaged 0.52 mm. longer and 0.3 mm. wider, and the corpora lutea from non-pregnant cattle averaged 0.77 mm. longer and 1.8 mm. wider than those reported by Elder.

The shape of the corpora lutea varied but the majority were nearly spherical. Only very few showed a distinct protuberance. In several cases the corpus luteum projected from the ovary as a round, more or less hemispherical enlargement. In most cases where the corpus luteum formed a protuberance it was of the type Elder speaks of as being shaped like an Erlenmeyer flask. In those cases the protuberance was 6-8 mm. broad, with a concave outer surface.

#### DETERMINATION OF THE COLOR OF BOVINE CORPORA LUTEA

In all cases the size of the ovaries and color of the corpora lutea were determined after hardening for 48 hours in 10 per cent formalin. After hardening, the ovaries were split longitudinally and measurements of the ovary and of the corpus luteum taken and the color recorded.

Elder, in his studies on bovine corpora lutea, divided them into ten groups, depending on their color. These ten colors he designated as follows: (1) no color; (2) light or pale yellow; (3) yellow; (4) bright yellow; (5) dark yellow; (6) dirty or muddy yellow; (7) yellow orange; (8) orange; (9) green brown; (10) red or brown. This classification is so indefinite as to be unsatisfactory. No two investigators would agree on just what color should be classed as light-yellow, a yellow orange, or any other of these designated. A classification in order to be satisfactory must be one so definite that two or more investigators should be able to take a given number of corpora lutea and group them into practically the same identical groups.

An attempt was therefore made to set up a standard color-chart, graduated from almost white to orange, in certain definite graduation, to assist in grouping the corpora lutea into definite

groups. With the cooperation and aid of Prof. Smith, of the Department of Physics of the Ohio State University, Maxwell color discs were so combined on a Bradley color-wheel that, when revolved at high speed, the desired ranges of color were obtained. The several colors consisted of the following combinations of the Maxwell discs:

- I. White 65%, yellow 35%.
- II. White 40%, yellow 50%, orange 10%.
- III. White 30%, yellow 50%, orange 20%.
- IV. White 20%, yellow 50%, orange 30%.
- V. White 10%, yellow 50%, orange 40%.
- VI. Yellow 50%, orange 50%.
- VII. Yellow 40%, orange 60%.
- VIII. Yellow 30%, orange 70%.
- IX. Yellow 20%, orange 80%.
- X. Yellow 10%, orange 90%.

After the ten shades were established, a color chart was made upon which each particular shade was duplicated. The color chart consisted of ten colors, ranging from nearly white to orange. In duplicating the several shades of the chart the following water colors were combined in varying amounts:

1. White: "Chinese white," prepared by Favor, Ruhl, and Co., New York and Chicago.
2. Yellow: "Cadmium," pale, prepared by the same firm as above.
3. Orange: "Chrome yellow," No. 3, prepared by Devoe and Reynolds.

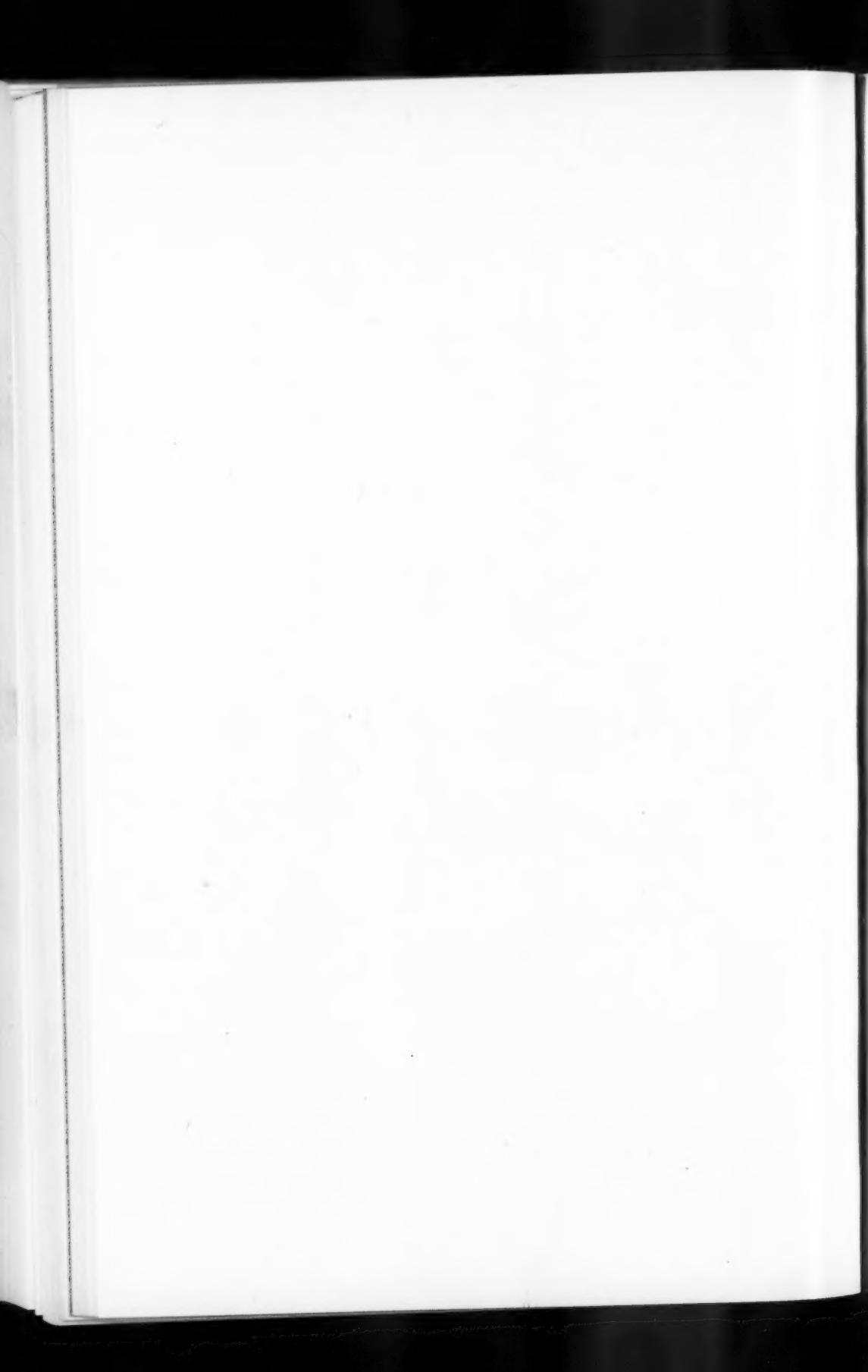
With this chart as a guide, it was not at all difficult to classify properly all except a very few of the corpora lutea studied. Several of the vestiges were slightly darker than color X, several had the characteristic muddy appearance described by several investigators, and one, that of animal 180, a non-pregnant heifer, was a dark reddish-brown, almost the color of liver, and could not be classified in any of the ten groups.

We found, as did Elder, that the majority of the corpora lutea studied fell within but a few of the ten groups. Of the 181 which could be classified from pregnant and non-pregnant cows, 141 (77.8 per cent) fell within the groups VI-IX, inclusive.

The color of the corpora lutea as recorded in this work was in all cases determined after fixation for 48 hours in 10 per cent formalin. McNutt<sup>7</sup> states that the color soon fades and to be correct should be determined immediately after slaughter. In order to determine the degree of fading that would occur during fixation, ovaries from animals 176-192, inclusive, were incised immediately, washed in water to remove as much blood from the surface as possible, and the color recorded. They were then

I.		White 65%; yellow 35%.
II.		Orange 10%; yellow 50%; white 40%.
III.		Orange 20%; yellow 50%; white 30%.
IV.		Orange 30%; yellow 50%; white 20%.
V.		Orange 40%; yellow 50%; white 10%.
VI.		Orange 50%; yellow 50%.
VII.		Orange 60%; yellow 40%.
VIII.		Orange 70%; yellow 30%.
IX.		Orange 80%; yellow 20%.
X.		Orange 90%; yellow 10%.

CHART I



placed in 10 per cent formalin for 48 hours and the color again determined at the end of that time. We found that in most instances the color at the end of 48 hours had faded one shade of the color-chart. In other words, a corpus luteum which was color IX when first incised was color VIII at the end of 48 hours. Ovaries 187 and 190 had not faded appreciably while ovary 186 had faded from X, when fresh, to VIII. These results would indicate that in most cases the colors as herein recorded would have been one shade of the chart darker if the ovaries had been incised when fresh.

It was suggested that perhaps the fading of the color during the process of the hardening was due to the action of the formalin on the blood present in the tissues. In order to determine if this is the case, ovaries from animals 193 and 194 were fixed in Kaiserling's solution. In both instances the color of the corpora lutea was IX when fresh. After being fixed in Kaiserling's solution, the color had not faded perceptibly but the corpora lutea had taken on a muddy yellow appearance. From but two corpora lutea definite conclusions cannot be drawn.

McNutt states that the activity of the corpus luteum is indicated by the amount of blood which oozes out when the gland is incised immediately after slaughter. Of these seventeen ovaries from pregnant and non-pregnant cows and heifers we could not detect much difference in the amount of blood which oozed from the cut surface of the corpora lutea. What variation there was appeared to have no relation to the stage or presence of pregnancy. In animal 182, pregnant two months, animal 184, heifer, pregnant one month, animal 187, aged cow, pregnant seven months, animal 190, aged cow, pregnant one month, animal 191, cow, pregnant one and one-half months, and animal 192, heifer, pregnant two months, there was slight hemorrhage from the cut surface of the corpora lutea, while, on the other hand, from the corpus luteum of animal 181, heifer, pregnant two months, that of animal 183, heifer, pregnant one and one-half months, and that of 185, heifer, pregnant two months, there was considerable hemorrhage. From the corpus luteum of animal 186, an aged cow, pregnant five months, there was much hemorrhage. There appeared to be no significant relationship between the amount of hemorrhage and the stage of gestation.

Table I gives the degree of pigmentation of the color of the corpora lutea studied as found in non-pregnant animals and in pregnant animals in different stages of gestation.

TABLE I.—*Relative occurrence of varying degrees of pigmentation of corpora lutea*

REPRODUCTIVE STATUS OF ANIMALS	NUMBER OF ANIMALS	INTENSITY OF PIGMENTATION*									
		I	II	III	IV	V	VI	VII	VIII	IX	X
Non-pregnant	67	0	1	1	6	6	5	12	12	12	12
1-2 mos.	60	0	1	1	1	2	14	22	11	7	1
3-4 mos.	36	2	1	0	1	2	9	7	7	6	1
5-6 mos.	10	0	0	1	0	0	5	1	2	1	0
7-9 mos.	8	0	0	0	0	0	1	2	2	3	0
Unclassified	13	—	—	—	—	—	—	—	—	—	—
Totals	194	2	3	3	8	10	34	44	34	29	14

\*Roman numerals refer to colors on chart I.

#### THE DETERMINATION OF THE RELATIVE AMOUNT OF FAT IN BOVINE CORPORA LUTEA BY STAINING

Sections of corpora lutea from ovaries which had been hardened in 10 per cent formalin were sectioned on the freezing microtome, 15 microns in thickness. After cutting, the sections from each corpus luteum were preserved in 10 per cent formalin until stained.

The stain chosen was Sudan III and was used as follows:

1. Sections removed from 10% formalin and placed in water for 30 seconds.
2. Placed in 60% alcohol, 30 seconds.
3. Stained with a saturated solution of Sudan III in 80% alcohol for 3 minutes.
4. Removed from stain and placed in 60% alcohol for 30 seconds.
5. Placed in water for 30 seconds.
6. Counterstained with Delafield hematoxylin for 20-30 seconds.
7. Washed in two changes of water for 30 seconds.
8. Mounted on slide in glycerin jelly and the edges of the cover-slip sealed with Canada balsam in xylol.

Long and Evans<sup>9</sup> recommend the use of Nile Blue sulphate for the staining of fat in tissues. This stain was tried out, but except for those preparations of which photomicrographs were desired was not found superior to Sudan III. They recommend that after staining with Nile Blue sulphate the preparations should be rendered alkaline by being treated with 1 per cent NaOH, upon the addition of which the globules of fat are changed from a dark blue to red. It was found that, if the preparations were not rendered alkaline, the globules photographed very beautifully with the use of a "G" filter. Many of the photomicrographs shown in the plates were stained with Nile Blue

sulphate without the preparations being rendered alkaline. By staining a large number of preparations and comparing those rendered alkaline with those not so treated the apparent amount of fat was the same. It was found, however, that the preparations which were not rendered alkaline could not be preserved for a long period of time as there was a tendency for the stain to crystallize out. It was found that for those preparations which were rendered alkaline that it was necessary to use alkaline glycerin jelly in which to mount them.

Several other stains were tried out and preparations stained with them were compared with preparations stained with Sudan III. Frozen sections of corpora lutea stained with Scharlach R could not be distinguished from those stained with Sudan III. In a recent number of *Stain Technology*, French,<sup>10</sup> of the Army Medical School, recommended the use of Oil Red O and of Candle Blue for the staining of fat in tissues. The efficiency of Oil Red O was compared with that of Sudan III and this stain appeared to give slightly better preparations than when the same sections were stained with Sudan III. It appeared to give better definition and the lutein cells appeared to show up with finer detail.

The relative amount of fat in frozen sections of bovine corpora lutea which had been stained with Sudan III was determined as follows:

Each preparation was carefully studied and the amount of fat recorded, the amount present being expressed in plus signs. In a section in which there was but a trace of fat the amount was expressed with one plus sign and in one containing the maximum the amount was expressed by six plus signs. The entire number of preparations were observed twice, the second time without referring to the former results; then, where there were discrepancies between the two observations, these preparations were studied for the third time and the results of the third observation were regarded as the correct reading.

A record of the observations made in this study is to be found in table II. It may be noted that in this table is a column giving the percentage of ether extract as determined by the Soxhlet method. A full description of the technic followed in obtaining the percentage of ether extract of various samples is to be found a little later in this paper. It should be noted that table II records only the results obtained in the determination of the relative amount of fat in representative samples; all corpora lutea were stained with Sudan III but not all were subjected to ether extraction.

An examination of table II shows very clearly that no direct relationship exists between the color and the fat content of

TABLE II—*Color and fat content of corpora lutea studied, grouped according to color*

ANIMAL	MONTHS PREGNANT	COLOR OF CORPUS LUTEUM	FAT CONTENT AS PERMITTED	
			BY STAINING WITH SUDAN III	BY ETHER EXTRACTION (%)
13	6	III	+++++	12.52
26	?	III	++++++	
45	2½	III	++	9.74
5	0	IV	+	15.60
29	0	IV	+++	
31	0	IV	++	
52	0	IV	+++	10.23
61	0	IV	+++++	12.90
169	0	IV	+++++	7.93
6	3	V	0	
11	0	V	++	
12	0	V	++++++	
17	2	V	++	4.53
22	0	V	++	
24	0	V	+++++	
40	0	V	++	5.10
51	0	V	+	11.42
1	0	VI	+++	
30	0	VI	+++++	
35	4	VI	0	12.69
37	5	VI	+	14.93
43	3½	VI	0	
55	2	VI	+++	
59	1½	VI	+	13.21
84	2	VI	++	12.95
87	3	VI (muddy)	+++++	12.04
92	6	VI	++	7.96
98	1	VI	0	
101	3½	VI (muddy)	+++	13.45
110	1½	VI	+++++	7.81
128	4	VI	++	6.35
172	3	VI	+	
8	2	VII	+	11.35
14	0	VII	+++++	
27	?	VII	++	10.50
63	0	VII	0	14.57
64	0	VII	+++	
73	2	VII (muddy)	++	15.51
76	1	VII	+++++	19.71
94	3	VII	0	
96	2	VII	0	10.22
97	2½	VII	++	12.93
114	2	VII	+++	11.86
117	4	VII	++	
118	0	VII	+++	13.32
119	2½	VII	+	9.48
126	7	VII	+++	13.06
136	2	VII (muddy)	++	7.18
139	0	VII	+++	10.87
160	0	VII	+++	19.45
175	2	VII	0	
2	0	VIII	+++	
36	5	VIII	+++	
68	1½	VIII	+	

TABLE II.—*Continued*

81	3	VIII	+++	
91	3	VIII	+	
106	7	VIII	++++++	17.90
121	0	VIII	++++++	13.06
122	5½	VIII	+++	7.72
125	4	VIII	++	8.60
129	2	VIII	+	
144	2½	VIII	+++	9.56
157	0	VIII	++++	14.83
161	3	VIII	++++	12.10
165	1½	VIII	+++	
167	0	VIII	+++++	11.20
20	2	IX	+	
54	2	IX	++	9.31
74	1½	IX	+++	16.55
82	1½	IX	++	14.70
90	4	IX	++	
99	7	IX	+++	21.13
131	0	IX	+++++	
133	5	IX	++	8.98
135	0	IX	++	8.67
142	0	IX	++	14.48
143	4	IX	++	6.21
153	1	IX	++	10.21
155	0	IX	++++++	
158	0	IX	+++++	13.52
159	4	IX	++	7.94
166	4	IX	++	9.20
7	0	X	++	
10	0	X	++	
25	0	X	++	
34	0	X	++	
60	0	X	++	
72	0	X	++	
75	0	X	++	
83	0	X	++	
104	0	X	++	
123	0	X	++	
150	3	X	++	
170	2	X	++	13.88 (cystic)

corpora lutea. Even a corpus luteum having so little pigment as to be grouped under color III contained the maximum amount of fat, as indicated by being stained with Sudan III. Among the corpora lutea grouped under color IV we have one containing but a trace of fat, while in the same group are others containing a large amount. In each of the other groups, with the possible exception of group X, this same condition is found. Even in group X we have corpora lutea varying in fat content from just above the minimum almost up to the maximum. Where there is so little uniformity we must conclude that there is no direct relationship between the color and the amount of fat present.

As previously mentioned, Palmer<sup>1</sup> reported that he had been unable to identify carotin in the corpora lutea of swine, so it was thought desirable to determine if fat were present in these tissues. Ovaries were obtained from sows on the killing-floor of the abattoir and were subjected to the same treatment as were those from cattle. It was found that the color of the corpora lutea from swine ovaries was uniformly a pinkish gray, about the color of veal steak, and could not be classified according to the color-chart. When sectioned on the freezing microtome and stained with Oil Red O and Nile Blue sulphate, respectively, the presence of fat was readily demonstrated. Figure 3 is a photomicrograph of such a section from the corpus luteum of sow 200.

#### DETERMINATION OF AMOUNT OF FAT IN CORPORA LUTEA BY ETHER EXTRACTION

That the determination of the amount of fat in tissue by the use of a fat stain, as Sudan III, etc., was not wholly satisfactory was indicated by the fact that when sections of vestiges which were color X or darker were sectioned on the freezing microtome and one section stained with Sudan III, one left unstained, and both mounted and examined under the microscope, the stained section could not be distinguished from the one which was not stained. (See figures 4 and 5.) From this it would appear that, where a section is highly pigmented, the amount of fat can not be accurately determined by staining alone. For that reason 77 corpora lutea which represented the different color groups were selected and were extracted with ether using the following technic:

The corpora lutea were removed from the ovaries which had been preserved in 10 per cent formalin for several months. All the connective tissue was removed from the surface and the material finely triturated in a watch-glass. The samples were then placed in a drying-oven, which was kept at 50° C. for several hours or until they were completely dried. After drying, the samples were weighed and placed in alundum thimbles and were extracted for 16 hours in Soxhlet extraction flasks, using redistilled ether. The weight of the collection flasks was determined before extraction was begun. At the end of 16 hours, the collection flasks were removed from the apparatus, the excess ether was evaporated, and the flasks were then placed in the drying-oven at 98° C. for 24 hours. At the end of this time, and after cooling to room temperature, the flasks were again weighed and the increase in weight was recorded as the weight of the ether extract. The flasks were then placed in a desiccator over calcium chlorid until needed for the next extraction.

The Soxhlet apparatus used consisted of five complete units. Four samples were run simultaneously each time a determination was made, the fifth Soxhlet being used as a control on the amount of solids present in the ether used for extraction purposes. At each determination the same volume of ether was introduced into the control flask as was used in the flasks in which determinations were being made and this ether was all

taken from the same stock lot. Thus the increase in the weight of the control flask could be considered to be due to the solids in the ether and this was taken into consideration in calculating the percentage of ether extract in the samples of corpora lutea which were concurrently analyzed.

Because of the very small amount of material available it was not possible to run the analyses in duplicate. For that reason a relatively large number of extractions were made.

Table III gives the results obtained in the determination of ether extract on those samples for which 0.5 gm. or more of dried material was available. In addition to the 29 samples

TABLE III—*Fat determination of corpora lutea by ether extraction*

ANIMAL	MONTHS PREGNANT	COLOR OF CORPUS LUTEUM	GRAMS EXTRACTED	NET GRAMS ETHER EXTRACT	PER CENT ETHER EXTRACT
167	0	VIII	.700	.0785	11.2
126	7	VII	.500	.0653	13.06
118	0	VII	.500	.0666	13.32
133	5	IX	.700	.0629	8.98
171	1½	VII	.700	.046	6.57
166	4	IX	.630	.058	9.2
145	0	IX	.500	.0405	8.1
125	4	VIII	.500	.043	8.6
139	0	VII	.514	.0559	10.87
150	3	X	.5443	.0754	13.85
142	0	IX	.6048	.0876	14.48
172	3	VI	.5685	.034	5.98
120	6½	VI	.5749	.0879	15.29
143	4	IX	.5838	.0363	6.21
173	4½	VI	.9111	.0579	6.35
135	0	IX	.5813	.0504	8.67
124	2½	VIII	.5153	.0258	5.39
122	5½	VIII	.5124	.0396	7.72
161	3	VIII	.7105	.0860	12.10
130	7½	VI	.6085	.0693	11.10
164	0	IX	.6825	.1122	16.44
158	0	IX	.6368	.0861	13.52
139	0	VII	.5957	.0673	11.29
136	2	VII	1.076	.0773	7.18
160	0	VII	.5458	.1062	19.45
153	1	IX	.5083	.0519	10.21
119	2½	VII	.6285	.0596	9.48
128	4	VI	.6590	.0515	7.81
162	4	VI	.6422	.0874	13.60

for which the amount of ether extract is recorded in the table there were 48 others extracted. Where the amount of dried material available for extraction was less than 0.5 gm. and the chance for error thus was comparatively greater, the data secured have not been tabulated; however, the percentage of ether extract in the smaller samples of corpora lutea showed no greater variation than in those where larger amounts of material were available.

An analysis of table III shows that the percentage of ether extract ranged from a minimum of 5.39 per cent in the corpus luteum of animal 124, a cow that had been pregnant two and one-half months, the color of which was VIII, to a maximum of 19.45 per cent in the corpus luteum from animal 160, a non-pregnant animal, the color of which was VII. The average amount of ether extract of the 29 extractions recorded in table III was 10.56 per cent.

This table further shows that there is no direct relationship between the color and the fat content of corpora lutea. The corpus luteum containing the least amount of ether extract was VIII in color, while the corpora lutea containing the largest amount of ether extract (animal 160) were color VII. Six corpora lutea, each of color VI, were extracted and the following amounts of ether extract obtained: 172, 5.98 per cent; 120, 15.29 per cent; 173, 6.35 per cent; 130, 11.39 per cent; 128, 7.81 per cent; and 162, 13.60 per cent. The corpora lutea of color VIII gave percentages of ether extract as follows: 167, 11.2 per cent; 125, 8.60 per cent; 124, 5.39 per cent; 122, 7.72 per cent; and 161, 12.10 per cent. Such marked variation in the content of ether extract of corpora lutea having the same color shows that no direct relationship exists between the two.

Table IV shows that there is perhaps less variation in the amount of fat present in the animals which are non-pregnant than those in the several stages of gestation. The animals in group 2, those in early pregnancy, show less variation in the amount of fat than any other group and the percentage of fat is higher than in groups 3 and 4. Groups 3 shows much more variation in the amount of fat present in the corpora lutea than any other group. In spite of the fact that these data represent so few animals, the findings of Tricomi<sup>4</sup> are confirmed, in a general way. He found that the amount of fat increased up to about the fifth month of pregnancy, when it decreased, to increase again toward the end of the gestation period.

It had been suggested that perhaps the corpora lutea from the ovaries of cows of certain breeds might be more highly pigmented than those from cows of other breeds; that highly colored corpora lutea might be characteristic of some breeds and not of others. It is a well-known fact that the skin of certain breeds contains much more yellow pigment than that of other breeds. In order to determine if highly pigmented corpora lutea were character-

TABLE IV—*Color and fat content of corpora lutea. Animals grouped according to state of pregnancy*

ANIMAL	MONTHS PREGNANT	COLOR OF CORPUS LUTEUM	FAT CONTENT AS DETERMINED	
			BY STAINING WITH SUDAN III	BY ETHER EXTRACTION (%)
<b>1. Animals non-pregnant</b>				
118	0	VII	+++++	13.32
135	0	IX	+++	8.67
139	0	VII	+++++	10.87
142	0	IX	+++	14.48
145	0	IX	+++	8.10
158	0	IX	+++	13.52
160	0	VII	++++	19.45
164	0	IX	+++	16.41
167	0	VIII	++++	11.20
			Average	13.00
<b>2. Animals pregnant not over 2 months.</b>				
136	2	VII (muddy)	++	7.18
153	1	IX	+++	10.23
171	1½	VII	+++	6.57
			Average	7.99
<b>3. Animals pregnant between 2 and 4 months.</b>				
119	2½	VII	+	9.48
124	2½	VIII	+++	5.39
125	4	VIII	++	8.60
128	4	VI	++	7.81
143	4	IX	++	6.21
150	3	X	+++++	13.88
161	3	VIII	+++	12.10
162	4	VI	+++	13.60
166	4	IX	+++	9.20
172	3	VI	+	5.98
			Average	9.23
<b>4. Animals pregnant between 4 and 6 months.</b>				
122	5½	VIII	+++	7.72
133	5	IX	++	8.98
173	4½	VI	+	6.35
			Average	7.68
<b>5. Animals pregnant between 6 and 9 months.</b>				
120	6½	VI	++++	12.28
126	7	VII	+++	13.06
130	7½	VI	++	11.39
			Average	13.24

istic of certain breeds, the animals of each breed were grouped together in table V.

With so few animals of some of the breeds represented in table V, it is not possible to draw definite conclusions. However, it does indicate that high pigmentation is not a breed characteristic. The corpora lutea from the three Guernsey cows were color IX, but there were also Jerseys, Shorthorns, and a Holstein-

TABLE V—*Color and fat content of corpora lutea. Animals grouped according to breed*

ANIMAL	BREED	MONTHS PREGNANT	COLOR OF CORPUS LUTEUM	FAT CONTENT AS DETERMINED	
				BY STAINING WITH SUDAN III	BY ETHER EXTRACTION (%)
118	Holstein F.	0	VII	++++++	13.32
167	Holstein F	0	VIII	++++++	11.20
171	Holstein F.	1½	VII	+++	6.57
173	Holstein F.	4½	VI	+	6.35
126	Holstein-Hereford	7	VII	+++	13.06
139	Holstein-Hereford	0	VII	+++	11.39
143	Holstein-Hereford	4	IX	++	6.21
150	Holstein-Jersey	3	X(cystic)	+++++	13.88
119	Hereford	2½	VII	+	9.48
125	Hereford	4	VIII	++	8.60
128	Hereford	4	VI	++	7.81
130	Hereford	7½	VI(muddy)	++	11.39
120	Shorthorn	6½	VI	++++	15.28
122	Shorthorn	5½	VIII	+++	7.72
124	Shorthorn	2½	VIII	+++	5.39
142	Shorthorn	0	IX	++++	14.48
145	Shorthorn	0	IX	++++	8.10
158	Shorthorn	0	IX	++++	13.52
133	Jersey	5	IX	++	8.98
135	Jersey	0	IX	++	8.67
136	Jersey	2	VII	++	7.18
160	Jersey	0	VII	+++	19.45
162	Jersey	4	VI	+++	13.60
172	Jersey-Shorthorn	3	VI	+	5.98
153	Guernsey	1	IX	++	10.21
164	Guernsey	0	IX(cystic)	+++	16.41
166	Guernsey	4	IX	+++	9.20

Hereford with corpora lutea IX in color. The corpora lutea from Jersey cows varied from IV to IX. The most highly pigmented corpus luteum was X and came from animal 160, a Holstein-Jersey.

#### ACTION OF ALCOHOL UPON CORPORA LUTEA

In work which is not herein reported, a large number of the corpora lutea were imbedded in celloidin or paraffin and in the process of dehydration it was found that there was considerable

variation between different corpora lutea in the way they were acted upon by the different concentrations of alcohol.

In some instances in dilute alcohol there was evidence that either fat or pigment or possibly both were extracted. Others showed no evidence of this. No attempt was made to determine if it was fat or pigment which was extracted. A yellowish discoloration of the alcohol was taken as evidence that extraction had occurred. By consulting table VI it would appear that both were extracted. Corpus luteum 24 (color V) and corpus luteum 61 (color IV) showed extraction in 95 per cent and in absolute alcohol in twenty-four hours. Both of these were found to contain a large amount of fat when frozen sections were stained with Sudan III. This would indicate that in these two instances fat was extracted, both of these being so low in pigment. That in other instances pigment was largely the material extracted is indicated in the case of corpus luteum 75 (color X). This corpus showed marked extraction in alcohol while upon staining frozen sections with Sudan III it was found to contain but a small amount of fat. Corpus luteum 104 (color X) showed marked extraction in all concentrations of alcohol. When frozen sections of this corpus luteum were stained with Sudan III it was found to contain a large amount of fat. In this instance then, the material extracted was in all probability a mixture of pigment and fat.

Table VI shows the corpora lutea from which extraction occurred in the different concentrations of alcohol, their color according to our color-chart, and their fat content as indicated by staining frozen sections of the same corpora lutea with Sudan III.

When it was observed that fat or pigment was extracted from some of the corpora lutea and none from others it was thought that perhaps that where extraction occurred it might be an indication of the amount of fat present. The data gathered from table VI do not bear this out. For example, corpus luteum 53 (color VI) showed extraction in 95 per cent alcohol and in absolute alcohol, both in 12 and 24 hours. Yet upon being stained with Sudan III this corpus showed but a very small amount of fat. Corpus luteum 58 (same color as 53) which showed a marked amount of extraction in absolute alcohol also was found to contain but a small amount of fat when stained. On the other hand, corpus luteum 77 which showed slight extraction in 80 per cent, positive in 95 per cent, and marked in absolute alcohol,

was shown to contain a large amount of fat when stained with Sudan III. Likewise corpus luteum 104 (color X) showed marked extraction in 95 per cent alcohol and in 12 and 24 hours

TABLE VI—*Sections from which fat, apparently, was extracted by different concentrations of alcohol*

CORPUS LUTEUM FROM ANIMAL NO.	80% (24 HRS.)	95% (24 HRS.)	ABSOLUTE (24 HRS.)	COLOR OF CORPUS LUTEUM	FAT CONTENT AS DETERMINED BY STAINING WITH SUDAN III
24		+	+	V	++++++
49	+	+		VII	++++++
50	+		Slight	VII	++
54	+	+		IX	++
57	+	+++		Muddy	+
58	+	+++		VI	0
60	+	+++		X	++++++
61	Sl.	+		IV	++++++
63	Sl.			VII	0
64	+	+		VII	++++++
75	++	++	+	X	++++
76	Sl.	Sl.	+	VII	++++++
77	Sl.	++	++	VII	++++++
79	Sl.	+		IX	++
80	Sl.	+	Sl.	IX	++
81	Sl.	+	+	VIII	+++
82	Sl.	+	+	IX	++
83	Sl.	+	+	X	++++++
84	+	Sl.	+	VI	++
85	Sl.	+	+	IX	+
87	+		Sl.	VI	++++++
88	Sl.	++	+	VIII	+
89	Sl.	+	Sl.	VIII	++
90	Sl.	+	Sl.	IX	++
91	Sl.	Sl.	+	VIII	+
92	Sl.	Sl.		VI	++
93		Sl.		VII	++
95	Sl.	+	+	VI	++
96	+		Sl.	VII	0
97	Sl.	+	+	VII	++
99	Sl.			IX	++
100	Sl.		Sl.	VIII	++++++
101	+	++	Sl.	VI	++++++
102	+	++	Sl.	VII	++
104	++	++	Sl.	X	++
105			Sl.	IX	++++++
106		Sl.		VIII	++++++
108	Sl.	++	+	VIII	++
109		++	+	VIII	++
110	Sl.	++	+	VI	++++++
111		++	++	VII	++
116		++	+	VI	++++++

in absolute alcohol was shown to contain a relatively large amount of fat upon being stained.

It was concluded, therefore, that the amount of extraction which occurred in different concentrations of alcohol in the process

of imbedding could not be depended upon as an index of the amount of fat present.

#### LIPOID CONTENT IN PARAFFIN-IMBEDDED SECTIONS

We found, as did Elder,<sup>8</sup> that in the process of imbedding sections of corpora lutea in paraffin the lipoid was dissolved out, leaving open spaces where the globules of fat had been.

Long and Evans<sup>9</sup> reported on the use of a method, a modified Meves and Duesberg method, which they had used in imbedding corpora lutea from rats, in which the lipoid remained *in situ* and was not removed by the different reagents used in the process of imbedding. Their method of imbedding was as follows:

Ovaries were fixed in Benda's fluid for 48 hours, rinsed with distilled water and placed in a solution consisting of equal parts of 1% chromic acid, and pyroligneous acid for 48 hours, rinsed again with distilled water and transferred to 2% aqueous solution of potassium bichromate for 48 hours. After this it is washed for from 12-24 hours in distilled water, dehydrated, cleared from 2-4 hours in cedar oil, transferred to xylol and imbedded in paraffin.

With their rat tissue they found that, after being treated in this manner when sectioned, mounted on slides and examined with the oil-immersion lens, the fat globules showed up sufficiently for examination.

This method was tried on 40 corpora lutea from bovine ovaries. The tissues were passed from 95 per cent alcohol to carbol-xylol instead of being cleared with cedar oil. Passing directly from carbol-xylol to xylol saturated with 43° paraffin, then into 43° paraffin, two changes, then into 55° paraffin and blocked.

Sections imbedded in this manner were cut at 7 microns but upon being examined unstained, the lipoids did not show up as black globules, as reported by Long and Evans, and it was feared that some mistake had been made in the technic. However, it was noticed that those sections that had been shown, by being stained as frozen sections with Sudan III, to have contained large fat globules did not show the open spaces which the same sections had shown when imbedded in the regular way in paraffin.

For that reason the thought suggested itself that perhaps the lipoid was there and would take the characteristic stain if treated with Sudan III. This was tried and found to be true. Such sections were stained with Sudan III, Oil Red O, and Nile Blue sulphate and of those stained with the latter stain photomicrographs were successfully made.

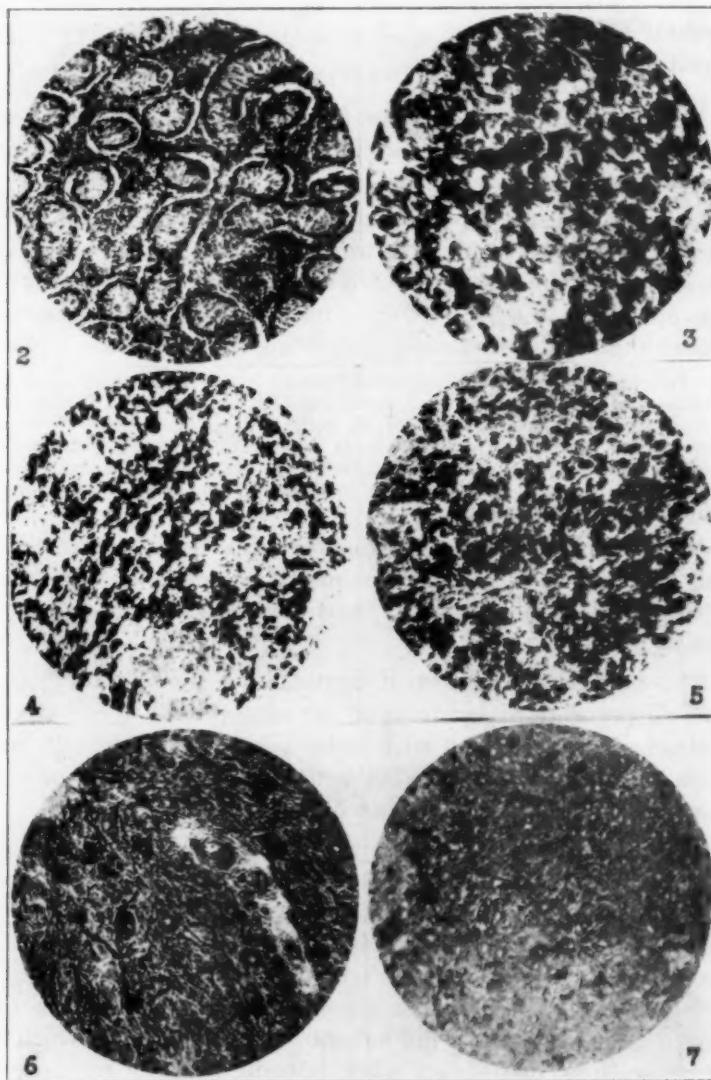


FIG. 2. Testicular tissue from animal 12.

FIG. 3. Corpus luteum (*suis*) from animal 200 (frozen section). Stain: Nile Blue sulphate; G. filter; low power; fat granules are black.

FIG. 4. Corpus luteum (vestige X) from animal 193 (frozen section). Stain: Oil Red O and hematoxylin; B. filter. Black granules are fat or pigment or a mixture of these.

FIG. 5. Corpus luteum (vestige X) from animal 193 (frozen section). Stain: Hematoxylin; B. Filter. Black granules are pigment or a mixture of fat and pigment.

FIG. 6. Corpus luteum from animal 119 (low power). Section showing very little fat, which shows as small black granules.

FIG. 7. Corpus luteum from animal 144 (low power). A section showing only a small amount of fat. Fat granules are deep black and very small.

It was suggested that perhaps there is enough difference between the character of the lipoid present in the rat corpus luteum and that in the bovine that the one would be turned black and the other not. Whatever the cause, the fat globules were retained in the tissues, were not dissolved out by the alcohol or carbol-xylol, and could be demonstrated by being stained with fat stains, and the fat demonstrated in photomicrographs.

#### PHOTOMICROGRAPHS

With the exceptions of figures 1 to 6, the accompanying photomicrographs were taken of sections of corpora lutea which had been imbedded in paraffin after the method recommended by Long and Evans.<sup>9</sup> Nile Blue sulphate was the stain used, and the preparations were not rendered alkaline.

The section shown in figure 2 was imbedded in paraffin in the usual manner and stained with hematoxylin and eosin. Those shown in figures 3, 4 and 5 were made from frozen sections. Figure 3 was stained with Nile Blue sulphate while figure 4 was stained with Oil Red O and hematoxylin, and figure 5 was stained with hematoxylin alone.

Special attention should be called to figures 4 and 5. As has been noted, a frozen section of a red vestige when examined under the microscope can not be distinguished from a similar section which had been stained with Sudan III, and the same is true when Oil Red O is used instead of Sudan III. The tissue shown in figure 4 was stained with Oil Red O and hematoxylin and this preparation could not be distinguished from the preparation shown in figure 5 of the same tissue, which had been stained with hematoxylin alone.

In making all of the photographs, the same microscope, with the same objective and ocular, was used and the camera in all cases was so adjusted that the photographic plate was 47 cm. above the bottom of the tube of the microscope. For the low-power photographs a 16-mm. objective and a 10x hyperplane ocular were used and for the high power photographs, the 4-mm. objective was used with the same ocular. By proceeding in this manner the magnification of all low-power and of all high-power photomicrographs is exactly the same. The magnification was measured directly by placing a Zeiss "objectmikrometer" on the stage of the microscope and obtaining a reading of the image on the ground glass of the camera against a millimeter rule. It

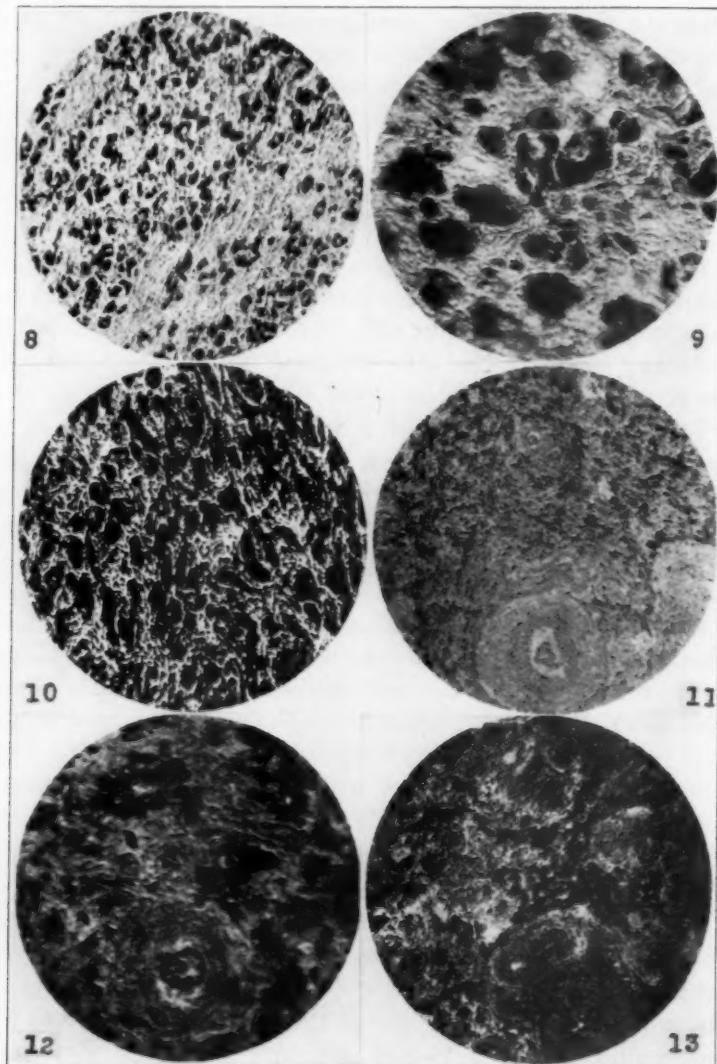


FIG. 8. Corpus luteum from animal 65 (low power). A section showing a relatively large amount of fat.  
FIG. 9. Same as figure 8 (high power).  
FIG. 10. Corpus luteum from animal 141 (low power). A section showing large fat globules.  
FIG. 11. Corpus luteum from animal 170 (low power). A section showing a relatively large amount of fat and, in addition, many blood-vessels.  
FIG. 12. Same as figure 11 (high power).  
FIG. 13. Corpus luteum from animal 7 (low power). A section where the majority of the fat globules were collected in groups or nests.

was found that the 16-mm. objective gave a magnification of 111.1x and the 4-mm. objective 511.1x.

#### SUMMARY AND CONCLUSIONS

The corpora lutea were graded as to pigmentation from gross section after fixation for 48 hours in 10 per cent formalin. Micro-sections were prepared in all cases and stained with Sudan III, when their relative fat content was determined microscopically. In 77 representative samples the fat content was also determined by the Soxhlet method.

A number of swine corpora lutea also were included in these studies.

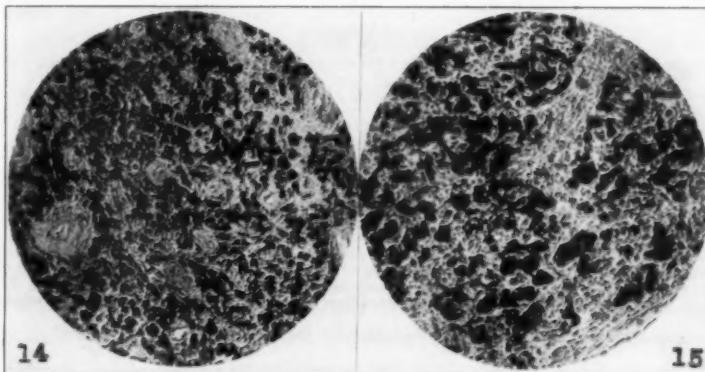


FIG. 14. Corpus luteum (*vestige*) from animal 145. A section in which there is a large amount of fat in small granules.

FIG. 15. Corpus luteum from animal 123 (low power). A section showing a large amount of fat in large granules. (Magnification exactly the same as in figure 14).

Comparisons were made of the degree of pigmentation of corpora lutea in the fresh state and after fixation comparisons were made also of Nile Blue Sulphate, Oil Red O, and Scharlach R as stains for the study of corpora lutea.

The data as recorded and tabulated are herein presented.

Forty representative samples were imbedded in paraffin by the method of Long and Evans and photomicrographs were made.

The color-chart, which was established for grouping bovine corpora lutea according to the intensity of pigmentation, was found applicable in 181 such structures out of the total of 194 studied. Swine corpora lutea could not be classified according to this chart.

It was found that the degree of pigmentation of corpora lutea does not run parallel with the amount of fat contained as determined by sectioning and staining with Sudan III or as determined by extraction by the Soxhlet method.

Moreover, it was determined that there is no relationship between pregnancy, the stage of gestation, or the breed of the animal and pigmentation or fat content of corpora lutea.

#### ACKNOWLEDGMENT

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VETERINARY RESERVE OFFICERS  
Fort Snelling, Minn., July 2-15, 1928

*Back row (left to right): Capt. W. L. Williamson, Lt. A. J. Matter, Maj. G. E. Bartholomew, Capt. G. W. Fitzgerald, U. S. A., Lt. Col. L. R. Smith, Lt. B. W. Conrad, Capt. R. A. Moye, Lt. L. E. Dietrich, Capt. E. F. Kallenberg, Maj. F. J. Younglove and Capt. C. A. Barr.*

*Middle row: Lt. C. W. Picht, Lt. D. H. Bibens, Capt. G. C. Bevan, Lt. W. G. Lashbrook, Lt. J. H. Kitshoer, Lt. G. S. Weaver, Lt. L. O. Fish and Lt. E. N. Davis.*

*Front row: Capt. F. B. Jones, Lt. F. A. Bonstetter, Lt. J. A. Patton, Lt. E. M. Brady, Lt. B. L. Caudill, Lt. M. L. Dietrich, Capt. H. W. Tornow, Capt. L. E. Willey and Capt. P. L. Ellis.*

## THE TOXICITY OF TREMETOL\*

By JAMES FITTON COUCH

*Pathological Division, Bureau of Animal Industry  
Washington, D. C.*

In a recent publication,<sup>1</sup> dealing with the etiology of trembles and milk sickness, it was shown that the only constituent of richweed or white snakeroot (*Eupatorium urticaefolium*) that could be considered responsible for the poisoning is tremetol, an optically active liquid compound. Final proof of the production of trembles by tremetol was delayed, owing to the small quantity of that substance available. A larger quantity has since been prepared and this, tested on a sheep, has caused the characteristic syndrome known as trembles.

Experiments on sheep have been made, using tremetol prepared from plants collected at different times and in different places. These have shown that the dose of pure tremetol necessary to produce trembles is higher than the dose of the plant calculated on a basis of tremetol content. This may be due to the manner in which the tremetol has been administered or it may be due to losses of material incidental to extraction and purification. In the latter case the figures for plant equivalent calculated from the weight of tremetol fed would be larger than they should be. The well-known fact must be borne in mind that many toxic constituents of plants are more actively poisonous in their natural condition in the plant than they are when isolated and purified. This does not necessarily indicate an alteration of the toxic substances, but may mean that they are more readily absorbed from the gastro-intestinal tract or are protected from some detoxicating action of the digestive juices. Tremetol is an easily altered compound but nothing is known about the conditions which obtain when it is introduced into the digestive tract.

Tremetol is a cumulative poison and the experimental feedings were made in several successive doses given one a day. This plan was adopted in the feedings with extracts that have been previously reported and was found satisfactory. There appears, however, to be a certain minimal dose required for the production of trembles and if less than that amount be given

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no effect or, at most, only slight symptoms are observed. This idea serves to explain some facts in the feedings with extracts and may explain the failure to produce trembles in two of the cases cited below.

*Case 1:* Sheep 782, a ewe that weighed 105 pounds was drenched with an emulsion of 0.5 gm. of tremetol in syrup of acacia every day from June 18 to June 21, 1924, a total of four doses. The animal showed nothing abnormal. The tremetol used in this feeding had been obtained by prolonged steam distillation of an active extract and it was thought at the time that the process had detoxicated it. In the light of what we now know it is probable that the dose was much below the minimal toxic limit.

*Case 2:* Sheep 6, a yearling ewe that weighed 83 pounds, was given a series of doses of pure tremetol emulsified in syrup of acacia. The tremetol used had been prepared from green richweed collected at Beecher City, Illinois, in 1925, and was of the highest purity. During the feeding two samples of blood were drawn each week-day and the content of sugar was determined (chart 1). Table I shows the doses given and the approximate

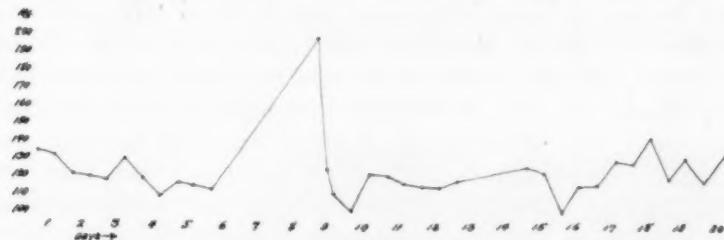


CHART 1. Blood-sugar curve of sheep 6, from Aug. 30 to Sept. 19, 1926. (Blood sugar in mg. per 100 cc plotted against time in days.)

weight of green plant per hundredweight of sheep represented by them.

On September 8 the supply of tremetol was exhausted and feedings were discontinued. The animal was kept under observation, however, and blood samples were obtained until September 19. From the 8th to the 13th of that month the animal was markedly depressed and walked with the awkward gait characteristic of sheep in the early stages of richweed poisoning. Some trembling of the shoulder muscle was observed which was most prominent from the 9th to the 13th. At no time did the sheep show the characteristic syndrome of trembles. There

was no odor of acetone on the exhaled air and no evidence of ketosis was obtained by analyses of blood and urine.

*Table I—Experimental feeding of tremetol to sheep in 1926*

DATE	DOSE (GM.)	PLANT EQUIVALENT (POUNDS PER 100)	EFFECTS
Aug. 30	0.5	0.875	None
Aug. 31	0.7	1.225	None
Sept. 1	1.0	1.75	Depressed
Sept. 2	1.0	1.75	Depressed
Sept. 3	2.5	4.375	Trembles gait
Sept. 7	2.5	4.375	Trembles gait
Sept. 8	3.0	5.255	Slight trembling
Totals	11.2	19.605	

The blood-sugar curve is represented in chart 1. This presents no abnormality except for the very high level observed on the morning of September 7, after the sheep had been rested for three days. As the level fell rapidly during the 7th, it was concluded that the event was not a result of the feeding but was due to some other cause.

*Case 3:* Sheep 8, a yearling ewe that weighed 88.5 pounds on December 7, 1927, was given daily doses of pure tremetol emulsified in syrup of acacia until symptoms appeared. The feedings were discontinued for four days and then another dose was given. A sample of blood was drawn each morning before the sheep was given the tremetol and was used for determination of blood sugar and acetone test. Table II shows the doses given, the equivalent of green plant calculated to pounds per hundredweight of sheep, the blood-sugar content, and the observed condition of the animal. The blood-sugar curve is represented in chart 2.

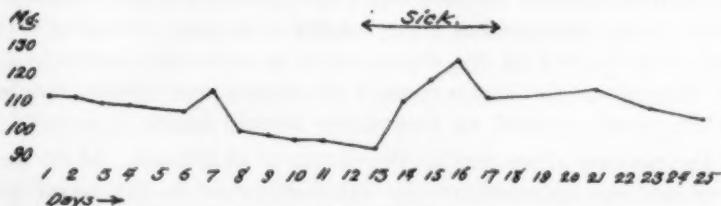


CHART 2. Blood-sugar curve of sheep 8, from Dec. 7 to 31, 1927. (The vinculum indicates the period during which the sheep was very sick.)

The sheep presented a characteristic case of trembles. During the height of the poisoning, on December 20, 21, and 22, the animal was lying down most of the time and was unable to stand

Table II—Experimental feed of tremetol to sheep 8 in 1927

DATE	DOSE (GM.)	PLANT EQUIVALENT (POUNDS PER 100)	BLOOD SUGAR (MG. PER 100 CC)	EFFECT
Dec. 7	1.0	1.75	113.4	Normal
8	1.0	1.75	113.6	Normal
9	1.0	1.75	111.3	Normal
10	1.0	1.75	110.3	Normal
12	2.0	3.5	109.2	Not normal
13	2.0	3.5	116.9	Not normal
14	2.0	3.5	102.	Not normal
15	3.0	5.25	101.1	Not normal
16	—	—	99.2	Symptoms
17	—	—	99.3	Trembles gait
19	3.0	5.25	96.1	Trembles gait
20	—	—	112.7	Depressed
21	—	—	120.7	Trembles
22	—	—	128.7	Trembles
23	—	—	114.4	Stronger
27	—	—	117.9	Recovering
29	—	—	110.3	Nearly normal
31	—	—	107.5	Normal
Totals	16.0	28.0		

at one period of several hours. She walked with the typical "trembles" gait and after exercise or exertion would assume the trembles position with the four legs placed well under the body and the back arched and then exhibit violent trembling of the shoulder, flank, croup, and thigh muscles. After the 23rd she made a rapid recovery and was normal by December 31.

The blood-sugar curve shows an interesting relationship. The amount of dextrose in the blood decreased steadily following the feedings except for a transitory increase on the 7th day (December 13), until December 19, when the sheep began to show marked symptoms of incipient richweed poisoning. Then the blood sugar increased sharply for the following three days, the period during which the sheep was very sick. The curve began to descend as the sheep started to recover and during the following week reached an essentially normal figure.

In this case there was no development of ketosis. At no time was acetone detected on the exhaled air or in the blood and urine. The fact that a well-marked, but non-fatal, case of trembles can be produced without the appearance of ketosis confirms the writer's earlier suggestion<sup>2</sup> that the ketosis is a result of the poisoning and not a cause. The development of ketosis with acetonuria is, however, a serious complication of

the disease and likely to lead to fatal results. It is possibly the chief factor in producing the deaths of trembles animals, since the most successful treatments of richweed poisoning are those designed to remedy "acidosis." If the ketosis can be eliminated, the prognosis is very good.

The data here presented considered in relation to those already published leave no reasonable doubt that the toxic constituent of richweed that is responsible for trembles and milk sickness is tremetol.

The writer wishes to take this opportunity to express his appreciation of the generous assistance given by Prof. A. A. Hansen and Prof. H. S. Jackson, in the collection of plants at Lafayette, Indiana; to Dr. L. T. Giltner, who took the samples of blood from sheep 8, and to Dr. John S. Buckley, for unfailing encouragement and support throughout the entire investigation.

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### NEWS ITEMS

A grant of \$200 has been made by the Provincial Department of Agriculture to the Veterinary Association of Manitoba.

At the request of Dr. F. H. Brown, state veterinarian of Indiana, Attorney Arthur L. Gillian recently ruled that county commissioners can not pay more than \$1500 as the annual salary of veterinarians engaged in tuberculosis eradication work. The ruling stated that veterinarians may be reimbursed for actual expenses incurred in connection with the work.

Officials of River Forest, Ill., have repealed the local ordinance, making the vaccination of dogs against rabies compulsory. It is reported that this action was taken because a local physician presented evidence to show that the antirabic vaccination is not 100 per cent effective.

The Delaware State Board of Agriculture recently found it necessary to adopt very stringent regulations to prevent the spread of anthrax in Kent County. The regulations provide for the immediate burial of carcasses of cattle dying of the disease and the removal of the hides is prohibited. A penalty of \$100 fine, or imprisonment for one month, or both, is provided.

## THE ANTIGENIC RELATIONSHIP OF BACTERIUM PULLORUM, BACTERIUM GALLINARIUM AND BACILLUS AERTRYCKE (B. PESTIS CAVIAE)

By F. P. MATHEWS, *Lafayette, Ind.*

*Department of Veterinary Science  
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Considering the amount of research which has been devoted to various members of the typhoid-enteritidis group, it appears unlikely that *Bact. pullorum*, *Bact. gallinarium*, and *B. aertrycke* have not been included in the same antigenic studies. If such is the case, the results of such studies have received but little consideration.

A possible similarity in the antigenic properties of these three organisms was brought to the writer's attention while studying the antigenic properties of *Bact. pullorum* and *Bact. gallinarium*. In these studies the complement-fixation test was used, and in testing for anticomplementary action of the antigens, the complement was found to be fixed in the absence of an immune serum. The source of the complement was found to be a guinea pig that was infected with an organism resembling *B. aertrycke*. *Bact. pullorum* and *Bact. gallinarium* were agglutinated by this serum in high dilution. This information was considered of sufficient interest to justify a study of the antigenic properties of the three organisms. A strain of *B. paratyphosus* B was included for the purpose of comparison.

The agglutination tests were conducted with antigens prepared by growing the organism on agar flats, and washing off the growth with physiological salt solution, to which .5 per cent of phenol had been added. The suspended bacteria were filtered through cotton and standardized to a turbidity of 3, according to McFarland's nephelometer. The agglutination-absorption tests were made with bacteria washed in physiological salt solution and sedimented by centrifugation. Small doses of the sedimented bacteria were added to the serum to be absorbed until the agglutinins for the absorbing strain were entirely removed in a 1-to-25 dilution.

Mature chickens were used for the production of antisera, following a preliminary test for bacillary white diarrhea and

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fowl typhoid. At least one antiserum was produced for each culture listed in table I by intraperitoneal injection of heat-killed bacteria, followed by intravenous injection of the phenol-killed bacteria.

The source of each culture used in these studies is given in table I. The reactions of the various cultures on dextrose,

TABLE I—*Sources of cultures used*

CULTURE	IDENTIFICATION	SOURCE
<i>Bact. pullorum</i>	P 21	Isolated from baby chick
<i>Bact. gallinarium</i>	P 6	Isolated from baby chick
<i>B. aertrycke</i>	3	No. 922—T. Smith
<i>B. aertrycke</i>	4	No. 146—C. Krumweide, Jr.
<i>B. aertrycke</i>	5	Isolated from stock guinea pig
<i>B. aertrycke</i>	5a	Isolated from stock guinea pig
<i>B. aertrycke</i>	6	Ent. 135 Jordan
<i>B. aertrycke</i>	7	Ent. 137 Jordan
<i>B. aertrycke</i>	8	K. Howell
<i>B. paratyphosus B</i>	1	T. 2 Jordan

maltose, xylose, mannose, rhamnose, lactose, sucrose, inulin, inosite, and salicin were typical for all strains except culture 8, which resembles *B. paratyphosus B* in its ability to ferment inosite.

The interesting features resulting from direct agglutination are presented by four graphs listed in fig. 1. A study of these graphs shows a striking similarity in the antigenic properties of *Bact. pullorum*, *Bact. gallinarium*, and strains 3, 5, 5a, 6, and 7 of *B. aertrycke*. All of the antigens prepared from these cultures were agglutinated by their respective antisera, the only difference being in the relative agglutinability (A,B,C, fig. 1). The pullorum antigens were the most sensitive and agglutinated in a higher dilution than either the gallinarium or aertrycke antigens. Agglutinins for *B. paratyphosus B* were readily demonstrated in all *B. aertrycke*, but not *Bact. pullorum* and *Bact. gallinarium* antisera. As a rule, the titer for *B. paratyphosus B* was the same as it was for its homologous antigen (graph C).

Further evidence of similarity in antigenic properties of the five guinea pig and two chicken paratyphoids was obtained with the agglutinin-absorption tests. The agglutinins for *Bact. pullorum*, *Bact. gallinarium*, and the five strains of *B. aertrycke* were entirely removed from their respective antisera by absorption with any of the seven cultures (table II). The group agglutinins in the antisera for the five aertrycke strains were readily ab-

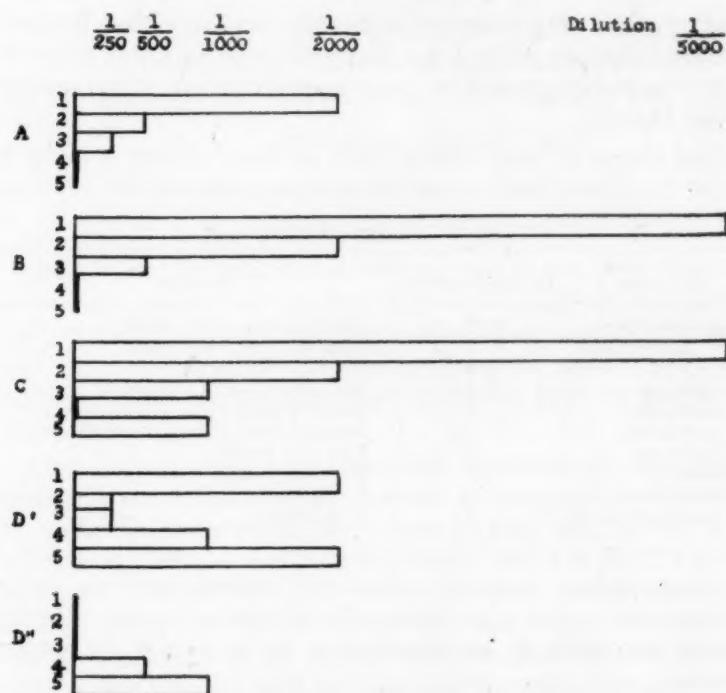


FIG. 1. Agglutinin titer of antisera for (A) *Bact. pullorum*, (B) *Bact. gallinarium*, (C) *B. aertrycke* 5, (D) *B. aertrycke* 4 unabsorbed, (D') *B. Aertrycke* 4 absorbed with *Bact. gallinarium*; 1, *Bact. pullorum*; 2, *Bact. gallinarium*; 3, *B. aertrycke* 3, 5, 5a, 6 and 7; 4, *B. aertrycke* 4 and 8 5, *B. paratyphosus* B.

sorbed by either *B. paratyphosus* B or the two *B. aertrycke* strains 4 and 8, with but slight reduction on the titer of the sera for *Bact. pullorum*, *Bact. gallinarium*, and their homologous antigens. Two types of agglutinins in the pullorum or gallinarium antisera could not be demonstrated in like manner.

The ability of the two *B. aertrycke* strains (4 and 8) to absorb

TABLE II—Agglutinin absorption

ANTISERUM	ABSORBING STRAIN			
	PULLORUM P 21	GALLINARIUM P 6	AERTRYCKE 5	AERTRYCKE 4
Pullorum P 21	Complete Absorption	Complete Absorption	Complete Absorption	Not absorbed
Gallinarium P 6	Complete Absorption	Complete Absorption	Complete Absorption	Not absorbed
Aertrycke 5	Complete Absorption	Complete Absorption	Complete Absorption	Absorbed for <i>B.</i> <i>paratyphosus</i> B

but one type of agglutinin in the antisera for strains 3, 5, 5a, 6, and 7, suggested a difference in their antigenic properties. This difference is more definitely shown in graph D, which illustrates the results with a *B. aertrycke* 4 antisera before and after absorption. The unabsorbed serum agglutinated all the organisms included in the present studies. Absorption with *Bact. gallinarium* P 6 removed the agglutinins for *Bact. pullorum*, *Bact. gallinarium* and the five strains of *B. aertrycke*. The titer of the absorbed serum for *B. paratyphosus* B and its homologous antigen was reduced about 50 per cent. These results were duplicated when either *Bact. pullorum* or *B. aertrycke* was used as the absorbing strain. An antiserum for *B. paratyphosus* B was tested and found to have a higher titer for all antigens, but otherwise it reacted much the same as the one illustrated in graph D.

Since the antigenic properties of *Bact. pullorum*, *Bact. gallinarium* and the five strains of *B. aertrycke* were found to be quite similar, it was decided to test the immunity of hens injected with the aertrycke strains against *Bact. gallinarium*. A total of 24 hens, four of which had been injected with strains 4 and 8, twelve with strains 3, 5, 5a, 6, and 7, and eight controls were fed virulent cultures of *Bact. gallinarium*. The four birds, that had been injected with strains 4 and 8, and the eight controls died or were killed on account of showing marked symptoms of fowl typhoid at the end of three weeks. Autopsies in every case showed marked lesions of the disease. Of the twelve birds injected with cultures 3, 5, 5a, 6, and 7, four died from fowl typhoid, but the remainder were healthy when autopsied at the end of three weeks, and showed no evidence of the infection.

#### SUMMARY

Antisera for *Bact. pullorum* and *Bact. gallinarium* agglutinated five out of seven strains of *B. aertrycke*. The agglutinins produced by the five aertrycke strains were separated into two parts by absorption with *B. paratyphosus* B. The unabsorbed agglutinin appeared identical with that produced by *Bact. pullorum* and *Bact. gallinarium*. Eight out of twelve hens injected with five strains of *B. aertrycke* were immune to *Bact. gallinarium*.

Two strains of *B. aertrycke* exhibited antigenic properties resembling those of *B. paratyphosus* B. Four hens injected with these two strains of *B. aertrycke* were not immune to *Bact. gallinarium*.

## A PRELIMINARY NOTE REGARDING THE PRESENCE OF DAVAINEA PROGLOTTINA IN WASHINGTON

By J. W. KALKUS

*Superintendent Western Washington Experiment Station of the  
State College of Washington*

In routine examination of poultry by autopsy at this station, over a period of years, we have frequently encountered the presence of so-called microscopic tapeworms in the intestines. Dr. W. T. Johnson called the writer's attention to this parasite in an occasional bird in 1923, and stated that he had observed it for a number of years prior to that time. No particular attempt was made to identify the worm or to determine its source, as it was not being encountered with any great degree of regular-



FIG. 1. A common species of garden slug which acts as intermediate host for the microscopic poultry tapeworm. (About natural size.)

ity nor was it considered to be causing any serious infestation. During the past two years, however, Drs. C. E. Sawyer and C. M. Hamilton, of our Veterinary Department, have been encountering this parasite with increasing frequency and are now of the opinion that it may become a serious economic pest in this section of the country.

During the past season a lot of one thousand pullets raised on free range on the Experiment Station grounds showed considerable infestation after being placed in the laying-house. Many of these birds became emaciated, were unthrifty and

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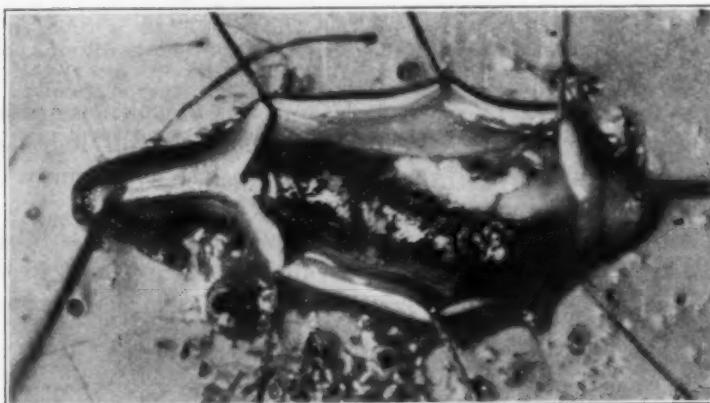


FIG. 2. A slug showing the abdomen exposed by an incision through the ventral median line. The small white spots are numerous cysticercoids, which are pearl-like bodies indistinguishable to the naked eye but readily seen with a low-power hand-lens. (Enlarged approximately four diameters.)

showed other indications of illness. Cestodes were found in varying numbers in birds autopsied. A study of the external characteristics indicates that in all probability these cestodes belong to the species known as *Davainea proglottina*. In making a search for the intermediate host of this cestode we have been



FIG. 3. Microphotograph of several cysticercoids removed from specimen shown in fig. 2. Note the invaginated area, the rostellar cirlet and the four sucker-discs plainly visible in some of these. These were imbedded in the slug's omentum and each represents a larval tapeworm. (Magnified about 150 diameters.)

able to demonstrate large numbers of cysticercoids in quite a large percentage of common garden slugs (probably *Limax civereus*) collected in chicken-yards.

The life cycle of *Davainea proglottina* was first demonstrated experimentally by Grossi and Rovelli<sup>1,2</sup> and their work indicates that infected slugs fed to chickens will cause the development of mature worms in the course of eight days.

In the United States the occurrence of the worm has been recorded by Ransom,<sup>3</sup> from Pennsylvania and Maryland. More recently it has been reported by Chandler,<sup>4</sup> who also demonstrated its life cycle experimentally.



FIG. 4. Microphotograph of an adult tapeworm about 2 mm. in length. This is one of many taken from the intestines of a bird fed an infected slug twenty-two days earlier. Note the head with rostellum and two sucker-discs showing. The terminal segment is mature, filled with eggs and ready to be detached. (Magnified about 50 diameters.)

During the past few weeks experimental work has been done at this Station by members of our Veterinary Department and by Mr. William W. Baker, our entomologist. For this work 6½-months-old cage-raised White Leghorn birds have been used. They have been fed varying amounts and numbers of naturally infected slugs and autopsied at varying times.

*January 26, 1928:* Four birds (1, 2, 3, and 4) were each fed one-quarter of a composite sample of three slugs showing cysticercoids (the slugs were cut in pieces). On the same date two birds (5 and 6) were fed one slug each containing no cysticercoids. Eight days later, bird 1 was autopsied

but no cysticercoids or tapeworms could be demonstrated in the intestines or intestinal contents. Fifteen days after feeding slugs, bird 2 was autopsied and numerous tapeworms were demonstrated in the intestines. Twenty-two days after feeding slugs, bird 3 was autopsied and numerous tapeworms demonstrated (anterior six inches of intestines, 62 worms). Eggs were demonstrated in terminal segments. Some worms showed six and seven segments. Twenty-five days after feeding slugs, bird 4 showed numerous tapeworms on autopsy.

Birds 5 and 6 were autopsied twenty-six days after feeding slugs but no tapeworms or cysticercoids were demonstrated. On February 2, 1928, bird 7 was fed one slug heavily infected with cysticercoids. This bird was autopsied twenty days later and 243 tapeworms were counted in the intestinal tract.

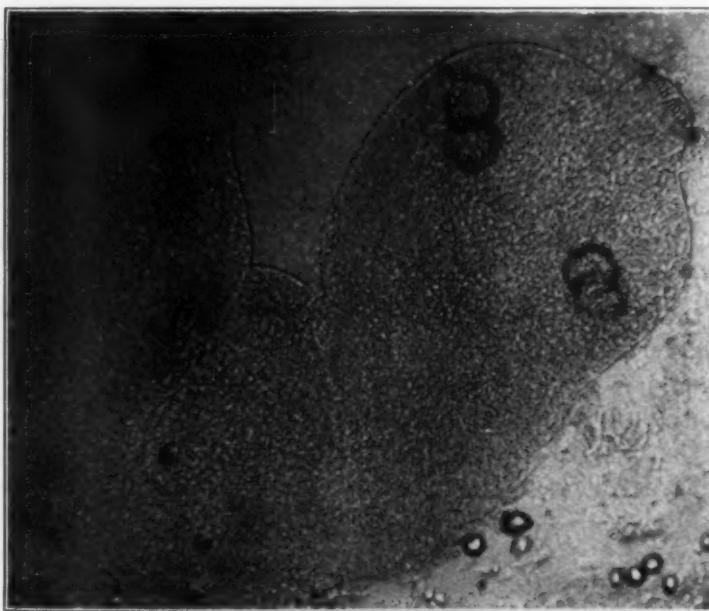


FIG. 5. Microphotograph of the head of the tapeworm shown in fig. 4. Note the projecting rostellum with hooklets and the four sucker-discs. Two of the latter are indistinct, as they are on the opposite side of the head, showing through the transparent tissue, and therefore slightly out of focus. (Magnified about 260 diameters.)

Slugs are a very common and widespread pest in western Washington, because of our mild, damp climate, and since it is now an established fact that the tapeworm harbored by them in its intermediate stage is found in many widely scattered districts, it is to be expected that control of the parasite will become an increasingly greater problem.

Experiments are now under way at this station for the further study of the life cycle of the parasite, its distribution, the effect on the host and suitable method of control. Since there are a

number of species of slugs in western Washington, a study of these is also under way.

It has been shown by Chandler that apparently some species are particularly susceptible to infection, while others are apparently quite resistant. Hence an attempt will be made to determine the various species, make a survey of their distribution, infect them artificially, determine the length of time necessary for development of infective cysticercoids and the length of time they remain infective.

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#### CONVENTION NOTES

Georgia sent one member to the meeting, Dr. C. L. Wagner, of Albany.

Dr. J. V. Knapp, State Veterinarian of Florida, was the only member present from the Everglade State.

Virginia had three members registered: Drs. H. C. Givens, of Richmond; R. A. Runnels and I. D. Wilson, of Blacksburg.

Alabama had two members in attendance; Drs. C. A. Cary and I. S. McAdory, both of the Alabama Polytechnic Institute, at Auburn.

Arkansas was another state with a pair of members in attendance: Drs. J. H. Bux, of Little Rock, and C. H. Noffsinger, of DeQueen.

Dr. M. Jacob, Knoxville; Dr. W. B. Lincoln, Nashville; Dr. W. M. Bell, Nashville, and Dr. John H. Gilman, Memphis, were the representatives from Tennessee.

A quintet of members were present from the Lone Star State: Drs. Ben F. Green, Cumby; J. S. Grove, Fort Worth; R. P. Marsteller, College Station; J. T. Trayler, Harlingen, and N. F. Williams, Fort Worth.

Considering the distance to Minneapolis, Mississippi was quite well represented at the meeting, with five members: Drs. C. B. Cain, A. & M. College; R. H. Mohlenhoff, Cleveland; O. M. Norton, Greenville; R. V. Rafnel, Jackson, and R. H. Stewart, Indianola.

## KENNEL GRANULOMA

By WILLIAM H. FELDMAN, Rochester, Minnesota

*Division of Experimental Surgery and Pathology, The Mayo Foundation*

That health is a relative condition is well exemplified in the case of certain formidable-looking, tumor-like growths which sometimes arise in the skin of presumably healthy dogs which have been confined for a long time in certain types of kennel cages. Grossly these formations resemble true neoplasms and a histologic examination is usually necessary in order to establish their true nature.

In a large population of dogs confined, except for frequent short periods of exercise, in cages with wire-grate floors, a dog is occasionally observed with such tumor-like formations. They usually appear over the posterior portion of the sternum (fig. 1) or over the tuber ischii (fig. 2). These regions are in contact with the grating of the floor of the cage when the animal is in a recumbent position or sits on his haunches, and hence are subject to slight though constant trauma.

In some dogs these growths develop with considerable rapidity, while in others they progress slowly. The growths seem to depend more on the susceptibility of the animal's tissue to irritative stimuli than on the length of time he has remained in a cage. They do not appear to embarrass the general health of the affected animal although from their size and position they may be somewhat annoying and disfiguring. Large growths are often offensive in appearance and for this reason surgical removal may be attempted.

Removal is not attended by any technical difficulty. The operation can be accomplished under local anesthesia, a 1 per cent solution of novocaine being satisfactory. Although the growths are easily removed, rapid recurrence takes place in many instances. Recurrence may occur indefinitely, but metastasis never occurs, and in this respect these expressions of hyperplastic scar tissue differ from certain of the true tumors with which they may be confused. Evidence is lacking that such tissue ever loses its granulomatous character and becomes a true neoplasm. The histologic appearance remains constant.

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### SUSCEPTIBILITY

The percentage of confined dogs which develop these tumor-like masses is very low, probably not more than 0.5 per cent. This low percentage suggests that the tissues of most dogs possess an inherent inhibitory factor which keeps the regenerative stimuli within certain physiologic bounds. The injured tissues



FIG. 1. Kennel granuloma. Sessile type of growth. The dog had been confined in a cage for sixteen months.

of those which do not possess this biologic inhibition engage in a continuous proliferation far in excess of the requirements of restoration. Once released from the restraining influence necessary for proper growth and maintenance, the tissues continue to proliferate until a definite tumor results. Here there is suggestive evidence that neither trauma nor irritation alone is sufficient to cause overproduction of tissue. The second factor might be

referred to as predisposition, lack of resistance, or an inherent biologic weakness on the part of the injured cells.

#### GROSS CHARACTERISTICS

Grossly these growths are of two types. In one type the mass is circular, raised abruptly above the surrounding skin, and has a sessile type of attachment (fig. 1); in the other it is pedunculated and somewhat irregularly lobulated (fig. 3). The size is variable and depends on several factors, such as duration of the disease, type of growth, and capacity of the particular animal's



FIG. 2. Kennel granuloma. Same animal as that shown in fig. 1, after confinement in a cage for twenty-four months. Growths over the tuber ischii are shown.

tissues to proliferate; the last is of maximal importance in determining the ultimate size which the growth may attain. The growths are devoid of hair and are of a flesh-pink color. They are tough, but their position on the animal's body renders them exposed to continual trauma and their extreme vascularity often causes hemorrhage. The surface is sometimes moist and infected. The infection, however, is usually mild and suppuration is rare. Manipulation does not seem to cause discomfort.

## PATHOLOGIC HISTOLOGY

Microscopically the growths are of simple design; the constituents are few and their arrangement is similar to that of a fibroblastoma. The predominating cell is an immature fibroblast which is characterized by overproduction of dense collagen material disposed in a very irregular manner (fig. 4). Mitosis is sometimes observed. The tissue is richly supplied with blood-channels, which are usually little more than capillaries, although small irregular arterial channels are occasionally seen (fig. 5).



FIG. 3. Kennel granuloma. Pedunculated type of attachment, irregularly lobulated, ten months after operation. The original mass had been removed after confinement in a cage for nineteen months.

The presence of infection is often demonstrated by the large numbers of polymorphonuclear leukocytes scattered throughout the tissue. Lymphocytic infiltration may also be observed. In areas that have been denuded of surface covering, leukocytic infiltration is particularly intense. The leukocytes usually show the effects of a retrogressive influence, and pyknotic changes of the nuclei are common. The tissue is invested with a layer of epidermis which is a continuation of the normal skin.

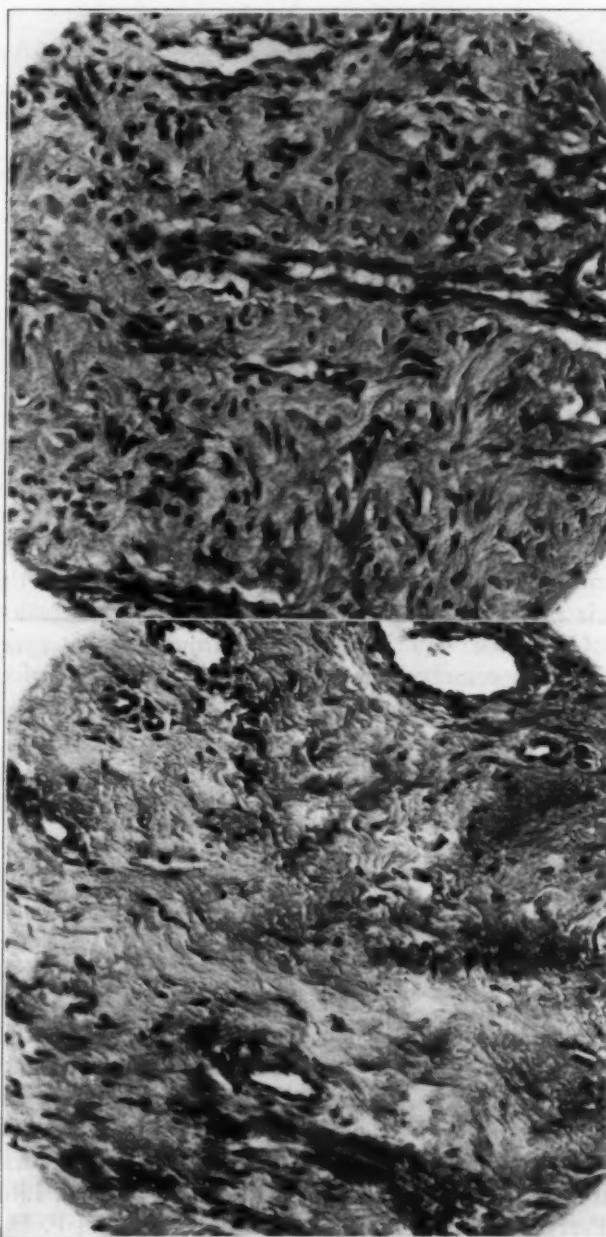


FIG. 4 (above). Keloid type of structure in growth shown in fig. 1. The presence of small blood-channels in the midst of dense fibrous tissue is typical of these structures. (x 220)

FIG. 5 (below). Growth from animal shown in fig. 3. Dense hyalinized collagen substance. Well-formed blood-channels are abundant. (x 220)

#### COMMENT

From the histologic picture it is evident that these growths are similar in most respects to granulation tissue and might be properly called keloids. They are not true neoplasms, since they arise as a direct result of a definite injury, the repair of which puts into operation a normal phenomenon characterized by the proliferative activity of the resident fibroblasts and associated vascular elements. The reaction differs from normal repair only in the fact that proliferation does not cease with restoration to normal. The fact that these granulomatous masses recur after removal but fail to metastasize rather definitely distinguishes them from the true neoplasms.

#### SUMMARY

In a small percentage of dogs, after continued and prolonged residence in cages with the grate type of floor, fleshy growths of a keloid nature develop in the skin. This small percentage suggests the existence of predisposition in the affected animals. The growths usually recur after removal. The fact that the histologic picture is that of a granulomatous proliferation with failure of the cells, even though of a vigorously growing recurrent type, to produce metastasis would remove this formation from the category of true tumors.

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#### CONVENTION NOTES

Canada was well represented with sixteen members from six provinces: Drs. J. C. Hargrave, Medicine Hat, Alberta; W. H. McKenzie, Vancouver, B. C.; J. A. Allen, W. Hilton, J. B. Still, and M. J. Kellan, Winnipeg; Harry H. Ross, Brandon, Manitoba; Orlan Hall, George Hilton, and Bruce Kennedy, Ottawa; C. D. McGilvray, Guelph, W. A. Henderson, Stratford, Ontario; J. A. Leish, Montreal; E. A. Watson, Hull, Quebec; M. Barker, Regina; S. Hadwen, Saskatoon, Saskatchewan.

Michigan sent nineteen veterinarians to the meeting: Drs. F. E. Caswell, North Adams; O. G. Davidson, Kalamazoo; H. Elzinga, Marne; M. J. Geiger, Croswell; Ward Giltner and H. J. Stafseth, East Lansing; E. K. Hansen, Marquette; L. J. Heiden, Escanaba; B. J. Killham, Lansing; F. M. McConnell, Litchfield; B. A. Perry, Hastings; R. D. Rice, Maple Rapids; F. E. Stiles, Battle Creek; G. M. Thorndike, Alto; J. Y. Veenstra, Grand Rapids; E. J. Watters, Houghton; H. Preston Hoskins, E. E. Patterson, and A. S. Schlingman, Detroit.

## CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

### AN INFECTIOUS DISEASE OF SWINE DUE TO AN ENTEROCOCCUS?\*

By A. VANDERHEYDEN and L. DESAINT MOULIN

Translated by T. P. WHITE, Washington, D. C.

The enterococcus is a normal saprophyte of the digestive tube of man and animal. It is found in the healthy subject in the mouth, the nose, the pharynx and throughout the alimentary canal. It has been found on the skin and on the genital organs of man and woman. This microbe was defined by Thiercelin and for a long time had been known to Egret, Besson and others under the name of streptococcus (encapsulated). Various names have been given to the organism, such as streptococcus of the mouth (Marot), *Streptococcus lacticus*, *Micrococcus ovalis*, diplococcus of Claude and Block, and *Streptococcus foecalis*.

Various investigators have noted streptococcic infection in swine. While the pathogenicity of the microbe may be limited in diseases peculiar to the swine species, certain observations made are deemed worthy of attention if only for the purpose of confirmation by other investigators or a further study of the organism, as it may be involved in morbid conditions found in swine herds.

For purpose of discussion, there is cited a case in which a pig about two months old figures. At autopsy the following data were acquired: skin very slightly marked, inflamed mucous membrane of eyes, general pleuritic adhesion, right anterior lobe of lung hepatized, partial degeneration of liver, slight inflammation of intestines, no ulcers, mesentery and lymphatic glands congested, discolored spleen, stomach and urinary bladder normal. The condition of the marrow in the long bones was not ascertained.

In the laboratory, cultures on bouillon and agar of material from the liver, spleen, lungs and lymph-glands and of the heart-blood gave growths of diplos, chains, and masses of tetrads. The cultures did not reveal the presence of *B. suis*, *B.*

\**Médecine Vétérinaire*, xi (1927), p. 469.

*suipesfier* nor the organism of swine erysipelas. Knowing that several pigs in the herd from which the subject had originated had died, the diagnosis of hog cholera was made.

However, having studied the germ isolated, its divers characteristics led to its being classed among the enterococci. With attention focused on this organism, a systematic examination was made of all pigs subsequently received and in three outbreaks of pig diseases, from which the germs of the ordinary swine diseases could not be isolated and in which there were no indications of hog cholera, the enterococcus was found. The symptoms in these outbreaks of disease were principally diarrhea and respiratory phenomena. Death was rapid. The principal lesions were those of severe enteritis.

#### CHARACTERISTICS OF ENTEROCOCCUS OF SWINE

The enterococcus of swine, like that of man, is polymorphous. Its superficial aspect is that of a diplostreptococcus. It often assumes the shape of a simple diplococcus, rounded or oval. It varies in size and is sometimes lanceolate. Perhaps its most constant characteristic is that of two or more bodies uniting at an angle. It is grown at ordinary temperature, preferably 37° to 38° C. It grows readily on ordinary media. In about 24 hours a white field appears and in 48 hours the growth is formed in a glairy deposit which adheres slightly to the sides and bottom of the tube. A characteristic considered important is the grayish-green color that the organism in its growth lends to the medium.

#### VACCINATION

In the human, favorable results are reported from vaccination. In swine, autovaccine has been used in a limited number of cases where the diagnosis of enterococcus disease has been made. A 24-hour culture of the organism on an ordinary medium was subjected to 65°C. for ten minutes. Each sick pig was injected with one cc of this dead culture, the injection being repeated in three days. This stopped further losses in the affected herd.

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#### ENTROPION IN LAMBS\*

By L. V. SKIDMORE

*University of Nebraska, Lincoln, Nebraska*

*Definition:* By entropion is meant the inversion or turning inward of the eyelid, so that the lashes rub against the globe

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of the eye. According to Cadiot and Breton<sup>1</sup> the eyelid may be inverted in part or in whole. One eyelid may be affected, sometimes both are involved, or the eyelids of both eyes may be affected.

During the past few years the author has observed this condition and operated on more than thirty lambs belonging to the University flock, which consists of 125 sheep of the following breeds: Oxfords, Hampshires, Southdowns, Rambouillet, and Shropshires. Entropion requiring surgical treatment was observed only in Shropshire lambs. Last year this condition was found in 12 out of 25 lambs. Slight cases have also been observed in Rambouillet lambs, but these always recovered without surgical interference.

*Animals affected:* Entropion has frequently been observed and described in dogs and horses. Jakob<sup>2</sup> describes the condition as being most common in the large dogs: St. Bernards, Danes, Pointers and Setters. Hounds are often affected. Reed<sup>3</sup> mentions that in little lambs the eyelid is sometimes turned under.

*Cause of entropion:* The cause is not definitely known. However, the author believes, from his observations, that this condition is an inherited congenital structural anomaly, because it is found in new-born lambs shortly after birth. W. Williams<sup>4</sup> says that "very often entropium is congenital." According to Aubry, Bordeau and Harmon, this condition has been met with congenitally in foals.\* Hadley and Warwick<sup>5</sup> state: "Nowadays most structural defects of new-born animals are regarded as heritable." Haltenhof<sup>6</sup> believes entropion to be inherited and it is caused, in his opinion, by overdevelopment in the skin of the lid. Brumley<sup>7</sup> states that "certain breeds of dogs are predisposed thereto from their breeding." According to Merillat,<sup>8</sup> "Although attributed to cicatrization of pre-existing traumas or inflammations, the cause is by no means plain." He states further: "In horses, however, both entropion and ectropion can always be traced to the cicatrization of a definite injury to the eyelids, an incomplete laceration, a through-and-through laceration, a contusion, or a surgical wound necessitated in the ablation of a tumor." While this latter statement is perhaps true in the case of the horse, it does not apply to many of the cases found in dogs and lambs. This condition is seen also in entropion musculare, which is due to the contraction of the ciliary part of the orbicular muscle resulting from senile atony.

\*Reference not seen.

A relaxation of the integument of the eyelids may also be responsible for this condition. The two latter-mentioned conditions are associated with aged animals, while the entropion described in this article is an affection of new-born lambs.

*Symptoms:* The eyelid or lids are inverted against the globe of the eye and the irritation from the eyelashes causes closure of the lids. Most authors agree that the lower lid is more often involved. In lambs there is a copious discharge of tears; some pus may form. The animals are uncomfortable and restless. They rarely rub the eye. The conjunctiva is reddened and congested with accompanying inflammation, with various degrees of keratitis present. Sometimes there is ulcer formation of the cornea and in extreme cases there may be adhesions of the lid to the cornea which usually results in permanent damage and blindness.

*Diagnosis:* The condition is easily recognized. The eyelid, usually the lower, or an upper, or perhaps both, are inverted, turned inward against the globe of the eye. If the finger is applied to the outside of the eyelid and the skin pressed down or up (depending upon whether the lower or upper lid is tested), the margin of the lid will go in proper position. When the finger is released and the eyeball is moved, the lid again becomes inverted.

*Treatment:* Simple cases may be treated by the daily application of boric acid salve. Such cases may be treated also by holding the lid in proper position by means of strips of adhesive tape. In many cases, surgical treatment is the best procedure and should be employed as soon as entropion is observed in order to protect the cornea from serious and permanent damage from inflammatory processes.

*Technic of operation:* The animals are restrained by laying them on one side with the affected eye uppermost. The head is held firmly. The use of a local anesthetic may be employed. The hair and wool are clipped for a distance of about three-fourths of an inch from the edge of lid. The area is washed with a 2 per cent boric acid solution. A fold of skin one-fourth inch from the edge of the lid and parallel to it is picked up with a pair of forceps, midway between the outer and inner canthus of the eye. Care is taken not to draw the conjunctiva into the picked-up skin fold.\* Now, with a pair of scissors, an elliptical piece is excised, according to the degree of the inverted lid. The operator must determine just how much to remove,

for if too much is removed, eversion of the lid will follow and if too little, inversion will remain. It is always better to remove too little than too much.<sup>10</sup> Some operators state that they do not suture the surgical wound in such animals as the horse and dog. Others give a preference for suturing. In lambs, the author prefers to suture the wound with two to four interrupted sutures using No. 7 braided silk suture.

*Prognosis and after-treatment:* If the operation has been properly performed before serious damage is done to the eye, the prognosis is always favorable. There is no danger from hemorrhage. The wound heals very readily and the stitches can be removed in 5 to 7 days. No further treatment is necessary.

The following references treat with entropion in the horse and dog. No mention is made of this condition in lambs in any of the references with the exception of Reed.<sup>3</sup>

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- <sup>8</sup>Merillat, L. A.: Veterinary Surgical Operations (Alexander Eger, Chicago, 1910), III, p. 453.
- <sup>9</sup>Williams, W. L.: Surgical and Obstetrical Operations (2nd ed. rev.; W. L. Williams, Ithaca, N. Y., 1907), p. 50.
- <sup>10</sup>Scott, W.: An Indexed System of Veterinary Treatment (Alexander Eger, Chicago, 1922), pp. 169-170.

## REPORT OF AN OUTBREAK OF POISONING IN THE DOMESTICATED FOWL, DUE TO DEATH CAMAS\*

By K. W. NIEMANN, Manhattan, Kansas

### INTRODUCTION

Death camas (*Zygadenus* sp.) poisoning is known to occur naturally in sheep and cattle and sometimes in horses and men. However, as far as can be learned, no cases of such poisoning occurring naturally among domesticated birds have been reported, which would indicate that the plant as a source of poisoning in fowls has probably been overlooked.

Death camas poisoning is more frequent in sheep and cattle than in other animals. This may be accounted for by the fact

\*Contribution No. 103, Department of Bacteriology, Kansas Agricultural Experiment Station. Received for publication, April 27, 1928.

that they are limited more to range conditions than other types of live stock and consequently are more subject to partial inanition with respect to green feed. This partial starvation often results in the ingestion of green plants that would otherwise be left alone due to their unpalatability. The fact that the disease has not been reported in domesticated birds is no doubt due to the usual abundance of more palatable contemporary sources of succulent feed.

The usual history of death camas poisoning includes a spring frost preceding the poisoning of mammals and it is reasonable to assume that this would apply to domesticated birds as well.

In March, 1927, a peculiar outbreak of poisoning among poultry was called to the attention of this Department and an investigation indicated death camas to be the cause.

#### DESCRIPTION OF THE PLANT

According to Marsh, Clawson and Marsh,<sup>1</sup> death camas belongs to the genus *Zygadenus* and the members of this genus generally conceded to be poisonous are *Z. glaberrimus*, *Z. intermedium*, *Z. mexicanus*, *Z. nuttallii*, *Z. paniculatus* and *Z. venenosus*. The offending plant in this case was identified as *Z. nuttallii*. The plant is ably described by Fleming and Peterson.<sup>2</sup>

The group of closely-related plants known as death camas were formerly included in the lily family; but this family has recently been broken up by botanists who placed the death camas in the "bunch-flower" family (Melanthaceae).

Death camas is commonly confused with the wild onion although it has no onion odor. When in bloom the two are easily distinguished, for all the flowers of the onion cluster grow out from the tip of the flower stem, while the flowers of the death camas grow along the sides of the stem.

The time when death camas starts to grow in the spring varies with the season and also with different exposures and different soils; the green shoots are sometimes found in the middle of March. The plants make their appearance first on sandy soils and on southern exposures which are usually favorable for the location of poultry-yards. On dark loamy and clay soils growth is much retarded; probably because these soils are moist and consequently warm up less readily. If the weather is fairly warm the death camas will begin to grow from ten days to two weeks after the snow melts in the spring; and the leaves are soon

high enough to be eaten. By the latter part of June the aerial portion of the plant has usually died.

Death camas is the name by which these plants are commonly known on the range; but they are also called mystery grass, poison sago, poison onion, lobelia, and poison camas.

The toxic principle of the plant is an alkaloid which resembles veratrin or cevadin. Since the toxic principle is alkaloidal in nature, no macroscopic postmortem changes are visible. However, symptoms of inanition, in cases where prolonged coma has preceded death, may be observed.

#### DISCUSSION OF THE OUTBREAK IN FOWL

The case in question occurred in March, 1927, the plants were numerous on the poultry range and it is probable that other sources of green feed were either unavailable or less prominent. No birds were received for examination but according to the owner the birds showed cerebral symptoms as evidenced by incoordination, dizziness, staggering gait, prostration and coma. The birds survived only from 24 to 48 hours after the first symptoms were noticed. Following a suggestion that the flock be confined, losses ceased. According to available history some losses had occurred on this same range in preceding years.

#### EXPERIMENTAL OBSERVATIONS

A sample of the offending plant was sent to the laboratory for examination. A small amount (five to ten grams) of this material was ground in a mortar and fed to a Single Comb White Leghorn cockerel. In 12 hours marked symptoms of poisoning were evidenced by salivation, incoordination, muscular weakness, staggering gait followed by prostration. Diarrhea was one of the early symptoms and persisted until death. The droppings were characterized by a peculiar, penetrating, highly disagreeable odor. Following this the bird became semi-conscious and remained in this condition with a very limited consumption of food and water until its death. It apparently improved on the 18th day, but died on the day following. The picture (fig.1) was taken on the 17th day.

Specific macroscopic autopsy findings were negative except for the strong, penetrating, disagreeable odor present. The bird showed pronounced muscular and glandular atrophy. The lumen and contents of the intestine were markedly diminished. The mesenteric and abdominal blood-vessels showed

marked passive congestion. The lungs were markedly anemic. The described changes with the exception of the odor may be ascribed to the partial inanition and the lack of specific post-mortem changes is due to the fact that the active toxic principle involved in this case was an alkaloid.

#### TREATMENT

Remedies that have been suggested<sup>1</sup> are: caffeine and diuretin, strychnin, eserin, charcoal, whisky and digitalis, potassium permanganate, tannic acid, sodium bicarbonate, repeated doses of tannic acid and sodium bicarbonate, and bleeding.

However, in the case of chickens it is not usually practicable to attempt to treat the birds by any one of the above methods, their value being questionable. The most practical treatment for affected birds is to remove them to a quiet place and give



FIG. 1. Bird 17 days after having been fed death camas. Note prostration.

each one a purgative such as castor oil, linseed oil or Epsom salts. Unaffected birds should be confined until other sources of succulent feed are more available or the offending plants less available.

#### CONCLUSIONS

1. The occurrence of death camas poisoning in domesticated birds is probably rare, but may occur.
2. Treatment consists in confining all unaffected birds until danger of grazing upon the plant no longer exists. Purgatives and isolation are recommended for affected fowls.
3. Prophylactic measures consist in recognizing the plant and keeping the birds away from it.

#### REFERENCES

<sup>1</sup>Marsh, C. D., Clawson, A. B., & Marsh, H.: *Zygadenus or death camas*. U. S. Dept. Agr. Bul. 125 (1915).  
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**SALMONELLA PULLORUM INFECTION IN RABBITS\***

By J. F. OLNEY

*University of Nebraska, Lincoln, Nebraska*

On March 3, 1928, four rabbits were brought to the laboratory for examination. Two of these rabbits had died during the night, and two were sick and died shortly after being received.

The following history was given by the owner. About twenty-five of the breeding rabbits had died within two days. They were mature stock and in a very good state of nutrition. Upon inquiry regarding the feed, care and management, the owner stated that three or four days previous to the first death he had fed infertile eggs which had been incubated for eighteen days. The eggs were fed raw by mixing them with a grain mash. All rabbits in the breeding pens were kept in individual hutches, and fed an equal amount of the mash mixture.

The owner reported that by March 5 forty rabbits were dead, the following two days fifty more had died, and by March 12 he had lost 125 animals, leaving one buck and three does in his breeding units. He also reported that one-half of the rabbits over six months of age and one-third of those under six months, which were old enough to eat, had succumbed to the same malady. None of the suckling rabbits were affected.

**AUTOPSY**

Postmortem examination was made on seven rabbits dead from the disease. Each had the appearance of a reaction to a severe general infection. The heart, lungs, liver and kidneys showed a marked congestion. The most conspicuous change, however, was seen in the spleen, which was greatly enlarged and dark in color. More or less extravasation of serum was found in the thoracic and abdominal cavities.

**BACTERIOLOGICAL EXAMINATIONS**

Cultures were made from each of the seven animals examined. Inoculations from the heart, liver and spleen were made on plain agar media. At the same time, normal rabbits were injected intravenously with the blood of the infected ones. Rabbits inoculated with blood of the infected animals died as shown in table 1.

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TABLE I—*Results of rabbit inoculations (blood)*

RABBIT	INOCULATED	DIED
1	3-3-28	3-6-28
2		3-7-28
3	3-5-28	3-8-28
4		3-8-28

The sugar reactions of cultures obtained from these rabbits were the same as obtained in cultures taken from the rabbits fed on the infertile, incubated eggs.

Four rabbits were injected intravenously with the cultures obtained from the inoculated rabbits as follows:

Two were injected with a suspension of the organisms in sterile, physiological salt solution, using 0.5 cc. of the density of McFarmand's nephelometer tube 2. These rabbits died in less than twenty-four hours and the cultures taken showed the same sugar reaction as the others had shown, namely; acid and gas in dextrose and mannitol, and negative in lactose, maltose and sucrose. The second two rabbits were injected with one loopful of the same organisms. Results are shown in table II.

TABLE II—*Results of rabbit inoculations (culture)*

RABBIT	INOCULATED	DIED
1	3-6-28	3-10-28
2		3-11-28

Cultures were obtained from the heart, liver and spleen of each animal and each gave the typical *Salmonella pullorum* reaction on the five sugars used. Gelatin medium was not liquefied by these cultures after incubation for seventeen days.

In order to study the individual colonies and to test the purity of the cultures obtained, plates were made on March 8, and on March 11 a single colony was selected. The colonies were small, circular, opalescent, with raised surface and smooth edge.

TABLE III—*Sugar reactions of organism (24 hours)*

SUGAR	ACID	GAS
Dextrose	+	+
Lactose	—	—
Maltose	—	—
Sucrose	—	—
Mannitol	+	+
Arabinose	+	+

Table III shows sugar reactions of the cultures taken from the one colony.

Media containing dextrose formed the most gas, mannitol second, and the smallest amount was produced in media containing arabinose.

#### AGGLUTINATION TEST

An antigen was prepared from these cultures by washing a 48-hour plain agar slant with phenolized physiological salt solution and diluting to a density of tube 1 of McFarland's nephelometer.

TABLE IV—*Agglutination tests*

DILUTIONS	1-50	1-100	1-250	1-500
Negative <i>Salmonella pullorum</i> serum . . . . .	—	—	—	—
Positive <i>Salmonella pullorum</i> serum . . . . .	+	+	Partial	—

#### CONCLUSIONS

The rabbits died of *Salmonella pullorum* infection following the feeding of infertile, incubated eggs obtained from a commercial hatchery.

#### ACKNOWLEDGMENT

Acknowledgment is made of the kindness of Dr. L. V. Skidmore, of the University of Nebraska, in carefully checking up the bacteriological and serological work reported in this paper.

#### ANOTHER TWO-LEGGED DOG

By REUBEN GORDON, *Patchogue, N. Y.*

I read with interest the article and report regarding two-legged dogs and wish to add Long Island as having possessed such a feature.

December 31, 1927, two young boys, about 7 and 8 years old, came to my hospital with a poodle about 5 months old that they wished destroyed. It had no front legs and was the only one of a litter of five pups so handicapped. However, the dog was able to navigate quite conveniently and could do most of the playful things dogs do despite the missing front legs. After keeping the animal for a week, so that I could study its habits, I destroyed it. I regret now not having taken a snapshot of it, but I do want to put Long Island on record as having had one of these two-legged dogs.

**STEINACH OPERATION\***

*By T. A. SIGLER, Greencastle, Indiana*

On March 9, 1925, I performed my first rejuvenation operation according to Steinach. I will not attempt to discuss at this time the theories or origin of the sex hormone as there have been many articles, both in medical and veterinary journals, describing the physiological actions advanced by Steinach and his followers.

The operation consists of a ligation, on one side, of the vas deferens, just above the epididymis, and the theory is that nature's effort to restore secretions there produces a sex hormone in the opposite or unligated testicle. In describing this operation the most important point to bear in mind is asepsis, so that no infection will follow, which would produce a fatal orchitis. The loss of a testicle would foil the operation.

The technic used by myself includes both the standing and recumbent postures. Suitable stocks such as are maintained in some of the larger breeding establishments, especially for the heavy breeds, or any suitable stanchion where the animal cannot drop down during the course of the operation, will be found satisfactory. It is much easier, however, to operate in the standing posture. The most important precaution is to guard against contamination of the wound when the animal defecates. In this respect the standing position has a distinct advantage over the recumbent position. It is hard to restrain very large animals satisfactorily and usually the owner will object to throwing a large bull.

In casting, we use Ruiff's rope-tie around the body. Over this the Merillat method, using the Ruiff rope in large animals only, to cause them to lie down easily. Use the Merillat method for restraint proper. Use the latter method only on small animals. By these means we can draw them up tight, pulling the leg well forward, which will let the scrotum hang free so that the operator can get at it conveniently. After cleansing the scrotum it should be brought back through a clean sheet and the site of operation painted with iodin. The next step is to inject a local anesthetic beneath the skin and cord.

An incision is then made on the external side of the neck of the scrotum, just above the epididymis, and down through the skin and subcutaneous tissue. Expose the cord, which is now

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\*Presented at the sixty-fifth annual meeting of the American Veterinary Medical Association, Minneapolis, Minn., August 7-10, 1928.

pulled out through the incision and fixed by placing a probe beneath it. Here one will encounter some fat, especially in the beef breeds, and this may give quite a little trouble in separating the vas deferens. The fat should be carefully removed in order to prepare the vas deferens for ligation. Cat-gut ligatures are applied with a common suture-needle. The vas deferens is ligated in two places, cut apart between the ligatures, returned to its position, the membrane sutured with cat-gut, and the skin sutured with silk. The wound is then painted with iodin and covered with collodion.

The first bull I operated on, March 9, 1925, was "Imp. Cromley Dale," Shorthorn, 12 years old, which had lost all sexual desire and was not used for two months after the operation. He covered as well as a young bull and got one calf after the operation, which seemed to pep him up all over, as the owner expressed it, and he seemed to move about with a more lively gait. This herd was dispersed a short time after this and he was sent to the yards.

The second bull operated on was "Imp. Rodney," Shorthorn, 12 years old. This animal had lost all sexual desire and was not used for about six weeks after the operation. He slipped on a concrete floor in his first attempt to cover and broke down in one hip. He never got up and was slaughtered.

The third bull, "Imp. Boarder Raider," Guernsey, 14 years old, died with pneumonia a short time after the operation.

There is no question but that the operation puts life and vigor in bulls after it is done. They seem livelier and the sexual desire is stimulated and it is claimed that the operation increases the production of spermatozoa. The operation should not be put off too long as the longer the bull is allowed to go the less satisfactory will the outcome of the operation be. I would like to see this operation tried out by my colleagues and the experiment stations.

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#### BANG BACILLUS DISEASE IN BULLS\*

By C. W. SPRINGER, *Uniontown, Pa.*

In February, I was called to see a registered Guernsey bull suffering with a very severe case of orchitis of the left testicle. This condition had appeared rather suddenly the day before I was called. The swelling was four or five times that of the

\*Presented at the sixty-fifth annual meeting of the American Veterinary Medical Association  
Minneapolis, Minn., August 7-10, 1928.

normal testicle and cord, producing rather severe lameness, with swelling of all four limbs, especially of the joints. There was a high fever (105° F.) with loss of appetite and rumination.

The patient was treated with febrifuge, laxative and stimulant medicine internally, as well as a local refrigerant application to the scrotum. After a few days, the fever subsided somewhat, as well as the acute inflammation in the scrotum and testicle, but the enlargement persisted.

A few days later, the owner had the bull slaughtered and the diseased testicle was forwarded to the State Laboratory for examination. In due course of time, a report was received from the Laboratory that a pure culture of Bang's abortion bacillus had been isolated from the testicle. This was the second case of this kind observed in bulls this spring, each having been slaughtered. Symptoms were identical in each case and, while I did not have a laboratory diagnosis in the other case, I believe the cause was the same.

It is not known how prevalent Bang bacillus infection is in these herds, as neither has ever been blood-tested. Just recently I have been advised that one of these herds has lost half a dozen calves by premature birth. The blood test will be made on this herd in the near future.

I will be pleased to hear from others who have had cases of orchitis in bulls and trust that this report will provoke a thorough discussion and bring out many points of interest.

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#### VETERINARIAN WANTED

The Commercial Club of Onamia, Minn., is very anxious to have a veterinarian locate in that village. Onamia is on the south shore of Lake Mille Lacs, one of the largest bodies of water in the state of Minnesota. The community is rapidly becoming quite a dairy center and the need for an experienced and capable veterinarian is being felt. At the present time, the nearest veterinarian is twenty-four miles away from Onamia. If interested, correspond with Mr. W. A. Benzie, President, First State Bank, Onamia, Minn.

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California sent a quintet to Minneapolis, consisting of Drs. George H. Hart and Fred M. Hays, of Davis; Leslie E. Pike, of Long Beach; C. E. Wicktor, of Los Angeles, and F. W. Wood, of Berkeley.

## ARMY VETERINARY SERVICE

### CHANGES RELATIVE TO VETERINARY OFFICERS

Captain Ralph B. Stewart has been relieved from assignment and duty at Fort Riley, Ks., effective September 1, and will report to the Commandant, Cavalry School, for duty as a student.

An additional student at the Army Veterinary School for the next term, beginning Sept. 1, will be Captain George L. Caldwell, who completed the troop officers' course at the Cavalry School on June 1.

Captain John W. Miner is temporarily under treatment at Walter Reed General Hospital, before going to his new station at Ft. Leavenworth, Ks.

Captain Wm. H. Dean has been assigned to temporary duty at Jefferson Barracks, Mo., for the period July 11 to August 11.

#### Reserve Corps

##### *New Acceptances*

Chase, Carl Eddie . . . . .	2nd Lt . . . . .	Londonderry, N. H.
Fitzgerald, T. C. . . . .	2nd Lt . . . . .	R. F. D. No. 4, Clyde, Ohio.
Gross, Geo. Dewey . . . . .	2nd Lt . . . . .	R. No. 1, Fredericktown, O.
Hectorne, Ronald Lester . . . . .	2nd Lt . . . . .	Avon, Ill.
Kleeman, Edwin P. . . . .	2nd Lt . . . . .	Clarksville, Tenn.
Martin, Carl L. . . . .	2nd Lt . . . . .	Colebrook, N. H.
Robb, Joseph R. . . . .	2nd Lt . . . . .	Cadiz, Ohio.
Scheetz, Geo. F. . . . .	2nd Lt . . . . .	South Charleston, O.
Thomas, Owen E. . . . .	2nd Lt . . . . .	Pataskala, O.
Thompson, A. T. . . . .	2nd Lt . . . . .	Ely, Minn.
Bishop, Wm. J. . . . .	1st Lt . . . . .	Bartlesville, Okla.
Edgar, Jean R. . . . .	2nd Lt . . . . .	Spokane, Wash.
Webber, O. B. . . . .	Captain . . . . .	Rochester, N. Y.

##### *Promotions*

Catlett, James G., to . . . . .	Major . . . . .	Health Dept., City Hall, Miami, Fla.
Low, Frederik, to . . . . .	Captain . . . . .	Oakes, North Dakota.
Farmer, Harvey T., to . . . . .	Captain . . . . .	3100 North Ave, Richmond, Va.

##### *Separations*

Bogan, James J. . . . .	2nd Lt . . . . .	Failed to accept reappointment.
Bogan, John L. . . . .	2nd Lt . . . . .	Failed to accept reappointment.
Bramer, C. N. . . . .	2nd Lt . . . . .	Failed to accept reappointment.
Brower, Wm. P. . . . .	2nd Lt . . . . .	Failed to accept reappointment.
Hess, Roy F. . . . .	2nd Lt . . . . .	Failed to accept reappointment.
Kidd, Harry L. . . . .	2nd Lt . . . . .	Failed to accept reappointment.
McCrillis, John J. . . . .	2nd Lt . . . . .	Failed to accept reappointment.
Merriman, Robt. Wm. . . . .	2nd Lt . . . . .	Failed to accept reappointment.
O'Malley, G. F. . . . .	2nd Lt . . . . .	Failed to accept reappointment.
Tremlett, James R. . . . .	2nd Lt . . . . .	Failed to accept reappointment.
Whipple, Earl F. . . . .	2nd Lt . . . . .	Failed to accept reappointment.
Moye, K. J. . . . .	Captain . . . . .	Failed to accept reappointment.
Pickup, Earle S. . . . .	Captain . . . . .	Declined reappointment.
Torgersen, H. E. . . . .	Lt. Col. . . . .	Declined reappointment.

Veterinarians of Scott County (Ill.) met at the Davenport Hotel, Davenport, Ill., June 12, 1928, and organized the Scott County Veterinary Association. Dr. H. F. Culp, of Eldridge, was elected president, and Dr. R. V. Beard, of Davenport, was chosen to act as secretary-treasurer.

## MISCELLANEOUS

### TESTIMONIAL DINNER TO DR. MALCOLM C. BAKER

May 30, 1928, marked two most happy events in the lives of the alumni of the Montreal and McGill Veterinary colleges, who gathered from far and near at Montreal to do honor, in the first place, to one of their much-beloved teachers, in the form of a testimonial reunion and dinner to Professor Malcolm C. Baker; and secondly, and on the same day, to attest by their presence at McGill University, their appreciation of the honors that day bestowed upon their colleague, Dr. Wm. Reid Blair, of New York City.\*

The dinner, which was attended by over thirty of the alumni, was held at the Windsor Hotel. The number attending from the United States was approximately that representing Canada. The entire affair was in every sense highly expressive of the love and good-will which prevails throughout the entire alumni body for their old teacher of anatomy, who is now seventy-eight years young, and, like Johnny Walker of Scottish fame, is still growing strong at that and able to do his daily dozen cases with the best of us.

Dr. Baker was graduated from the old Montreal Veterinary College in 1879, and was at that time appointed to the chair of Comparative Anatomy at that institution, a position which he filled with great and ever-increasing distinction for nearly a quarter of a century.

The banquet was of choice a closed alumni affair, the only person present, not an alumnus, being Dr. Baker's son, who, following the footsteps of his sire, shares with him the burdens of one of the largest practices in the Dominion.

The gathering was ably presided over by Dr. J. B. Hollingsworth ('98), and after the toasts usually offered upon such occasions, the toast to the guest of the evening was, in words highly appropriate to the evening and the person addressed, proposed by one of Dr. Baker's classmates, Dr. Charles Winslow ('79), of Rockland, Mass., and responded to by Professor Baker, who charmed his boys anew with the apparent ease with which he still seemed able to hold his class, by the simplicity and directness of his discourse, combined with the accuracy and intimacy

\*See JOURNAL, July, 1928, p. 375.

of his personal remembrances of various individuals present and some of their outstanding idiosyncrasies.

There was so much of intrinsic pleasurable interest in the whole evening, as to render the entire company, especially those from south of the line, almost oblivious to the qualities of law, as they appeal to personal freedom within the Canadian city. We have dwelt upon the love of former students for Dr. Baker, but lest we forget the more important point of his standing at home, let us quote the words of one of Montreal's most foremost citizens, spoken to the writer of these lines upon the morning of May 30, upon learning of the intentions to meet in Professor Baker's honor that evening:

I wish we men of Montreal had known of this affair, as there are thousands of Montreal's best who would like to have joined up with you in any honors you may wish to pay to "Mac" Baker tonight.

After the presentation to Professor Baker of a beautiful cane, suitably engraved, the happy and successful gathering came to a close with warm acclaim for the distinguished guest and the lusty singing of "Auld Lang Syne."

F. H. M.

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### HORSE-TRADING

*By N. S. MAYO, North Chicago, Ill.*

The advent of the automobile has practically eliminated this interesting though not necessarily lucrative business, or possibly better termed "game." In almost every community there were professional horse-traders, who made a rather precarious existence trading horses and in "guile and wile" they were "runners-up" on the famous "heathen Chinee." Even a church deacon quickly and completely discarded, though not visibly, all standards of ethics when it came to a horse-trade. I am sure there are many practitioners, who if they have not had some interesting and amusing horse-trading experiences, can relate some that their clients have told them under pledge of deathless secrecy. We hope that some of the readers of the JOURNAL will relate them, so that we can all enjoy them.

Down in Connecticut they used to hold an annual "Horse Traders' Convention," at Liberty Hill, until it was stopped, unfortunately, by the Humane Society. If some enterprising promoter could have put this Horse Traders' Convention on the road, he would have made a fortune, as a circus would afford no competition.

I got a horse at this convention (never mind what the other fellow got) and if I ever looked a horse over I did this one. He was "guaranteed to be all right every way" but of course, I knew better. The next day his "failing" was apparent. He would stand fairly well while being hitched, but when the lines were picked up or one stepped in the buggy, he would gather himself and make three jumps of about twenty feet each. If you were not in the buggy you did not go, and if you held him he would "rear up on his hind legs" and it was 50-50 whether he came down forwards or backwards. Various devices and plans were tried to break him of this trait but unsuccessfully. I think they had all been tried many times previously.

One day, I was at a livery stable in a nearby town and was starting for home when this horse went "up in the air." As he stood 17 hands, when he got up he could almost look over the top of the barn. A sympathetic stranger standing near asked, "What makes him do that?" I told him the horse had a cross of carrier pigeon blood in him and before he started for home he wanted to get his bearings. He said, "I'd break him of that." I asked him what he had to trade and we made a deal. Ten days later I saw the man and asked him if he had broken the horse yet. He said, "No, I swapped the d—n cuss off four days ago." Such was life in the "good old days."

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Texas, Agricultural & Mechanical College of. Catalog, 1927-28. (Bulletin. Third Series, Vol. 14, No. 4. College Station, Texas, April 1, 1928. pp. 299.)

Daubentonia Seed Poisoning of Poultry. A. L. Shealy & E. F. Thomas. (Bul. 196, Agr. Exp. Sta., Univ. of Fla., Gainesville, Fla., April, 1928. pp. 8.)

Ontario Veterinary College, Session 1928-1929, Calendar of the. Guelph, Ont. pp. 52.

Suggestions on Shipping Hogs in Hot Weather. Michigan Livestock Loss Prevention Association, Detroit, Mich. pp. 3.

New York State Veterinary College at Cornell University, 1928-1929, Announcement of the. Ithaca, N. Y., May 1, 1928. pp. 32.

Rabies Prophylaxis. Geo. W. Stiles. Reprint from *Colorado Medicine*, May, 1928. pp. 5.

Alabama Polytechnic Institute, College of Veterinary Medicine, Announcements for 1928-1929. Auburn, Ala., May, 1928. pp. 21.

Iowa State College of Agriculture and Mechanic Arts, Division of Veterinary Medicine, Announcement, 1928-1929. Ames, Iowa, 1928.

Rhodesia, Southern. Report of the Director of Veterinary Research for the year 1927. Salisbury, Rhodesia, 1928. pp. 14.

## ASSOCIATION MEETINGS

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### COLORADO VETERINARY MEDICAL ASSOCIATION

The semi-annual meeting of the Colorado Veterinary Medical Association was held at the Colorado Agricultural College, Fort Collins, May 24-25, 1928. The meeting was quite well attended.

Dr. R. R. Dykstra, of the Kansas State Agricultural College, presented two extremely interesting papers. The first was entitled "Diseases of the Reproductive Organs," presented the morning of the first day. In the afternoon Dean Dykstra presented "Anesthetics in Veterinary Surgery."

Other contributions to the program included "Bovine Mastitis," by Dr. H. E. Kingman, Fort Collins; "Dietetics and Fur Production in Silver Foxes," by Dr. Otis Perrin, Golden; and "The Outlook," by Dr. Geo. H. Glover, Fort Collins.

A short business session was held Thursday afternoon and in the evening the banquet and ball were held at Ammons Hall. The morning of the second day was devoted to a symposium on rabies. This was a joint meeting with the Cattle Feeders, held in the Livestock Pavilion. The afternoon was given over to a clinic.

FLOYD CROSS, *Secretary-Treasurer.*

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### MICHIGAN STATE VETERINARY MEDICAL ASSOCIATION

The forty-sixth annual meeting of the Michigan State Veterinary Medical Association was held at Michigan State College, East Lansing, June 26-27, 1928.

The meeting started with clinics for both large and small animals. This feature proved to be a good drawing-card. One of the features of the clinic was a demonstration of the use of the emasculatome on calves and rams.

After luncheon, the meeting was called to order by Dr. L. A. Wileden, of Mason, President, and an address of welcome was given by Mr. R. S. Shaw, president of Michigan State College. Dr. B. J. Killham, State Veterinarian, made the response.

Following a brief business session, Dr. R. F. Vermilya, in charge of federal meat inspection at Detroit, presented a very interesting paper, entitled, "Meat Inspection Regulations of

Interest to Practitioners." This paper brought out an unusual amount of discussion and many of the practitioners present put questions to Dr. Vermilya, which he promptly answered. Most of these had to do with emergency slaughter of animals in the country, under quite a variety of conditions.

Mr. Glenn S. Kies, district manager of the Peoria Life Insurance Company, gave an excellent talk, entitled, "Your Profession as the Public Sees It." The discussion of the paper by Mr. Kies was opened by Dr. H. Preston Hoskins, secretary-editor of the A. V. M. A., who suggested that it might have been more appropriate for Mr. Kies' paper to have been entitled, "The Veterinary Profession as the Public Fails to See It." Dr. Hoskins emphasized many of the good points brought out by Mr. Kies and, at the same time, differentiated between a business and a profession, as well as between publicity and advertising.

Immediately following the adjournment of the afternoon session, the members participated in a baseball game, between two very evenly matched teams. These were the "Practitioners" and the "Scientifics," with Dr. W. N. Armstrong, of Concord, officiating as umpire. Up to the time that this report was prepared, the score keepers had not finished their tabulations.

The evening was given over to the annual banquet, with Dr. Ward Giltner acting as toastmaster in his characteristic fashion. In the neighborhood of 200 veterinarians and their ladies were in attendance at the banquet.

The morning of the second day was devoted to papers. Dr. J. W. Patton, of Michigan State College, presented "Therapeutic Principles" and Dr. E. C. W. Schubel, of Blissfield, read a very interesting paper on the subject of "Field of Poultry Practice."

After luncheon, a paper that had been prepared by Mr. Murray G. Jenkins, a prominent attorney of New York City, on the subject of "Legal Entanglements of the Veterinarian," was read and discussed by Mr. E. C. Smith, a local attorney. This proved to be an outstanding feature of the meeting.

Dr. J. V. Lacroix, editor of the *North American Veterinarian*, very ably discussed small-animal practice in its various phases. He placed special emphasis on the proper hospitalization of canine and feline patients.

The election of officers resulted as follows: President, Dr. W. N. Armstrong, Concord; first vice-president, Dr. John A. Schaefer, Bangor; second vice-president, Dr. E. B. Cavell, Northville; third vice-president, Dr. M. J. Smead, Rochester;

secretary-treasurer, Dr. Edward K. Sales, East Lansing; member of the Board of Directors, for six-year term, Dr. H. Preston Hoskins, Detroit.

Dr. B. J. Killham made a report of progress on the plans for securing the 1929 meeting of the A. V. M. A. for Detroit.

E. K. SALES, *Secretary.*

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### ILLINOIS STATE VETERINARY MEDICAL ASSOCIATION

The fortieth semi-annual meeting of the Illinois State Veterinary Medical Association was held at East St. Louis, July 5-6, 1928. The first session was called to order by President F. A. Laird at 10:00 a.m. the first day. The minutes of the previous meeting were read and approved.

President Laird then delivered his address, in which he took occasion to remark that in his opinion we have passed the crisis through which the veterinary profession has been going and that the veterinary profession was never more appreciated than it is at the present time. Dr. Laird stated that there could be no permanent agricultural prosperity without healthy live stock and this demanded a veterinary profession to eliminate the hazards of the industry. He especially elaborated on the necessity of the profession accepting the responsibility of maintaining a strictly healthy live stock industry and that this meant all classes of live stock, from the canary bird up, including the dog, cat, sheep, swine, cattle and the horse. Dr. Laird said that the veterinarian who is not qualified to administer properly and intelligently to all these various classes of patients would of necessity be compelled to step aside and make room for the man capable of doing so. Preventive measures through sanitation and immunizing agents were properly stressed and the relationship between the live stock industry and the veterinary profession was clearly drawn. At the conclusion, all felt that they had listened to an address of real intelligent inspiration.

The first topic on the program was "Cattle Practice," presented by Dr. H. J. Schlesinger, of New Athens. The author stressed the gastro-intestinal diseases of cattle, particularly overloading of the rumen, in which he advised pumping in large quantities of water, followed by massage with a two-by-four scantling eight to ten feet long, lifting the abdomen, kneading with the knees from the side and thus assisting in moving the

contents of the rumen. This method may even be used in some instances for dislodging foreign bodies that might otherwise puncture the diaphragm and cause traumatic pericarditis. He sometimes dissolves one to two pounds of Epsom salt in the water to be injected. Drs. H. L. Campbell and L. A. Merillat, in discussing this paper, took occasion to commend the treatment outlined.

"Live Stock Losses Incidental to Transportation" was the topic discussed by Dr. V. W. Myers, of the Western Weighing and Inspection Bureau, National Stock Yards, East St. Louis. Following this paper, the meeting was adjourned for luncheon.

The afternoon session was called to order at 1:30 and Dr. Silas Kempf, of Roanoke, presented a paper, entitled, "A New Method of Treatment for the Septic Uterus." Dr. Kempf's treatment consists of siphoning all fluids from the uterus by means of a catheter, followed by blowing finely powdered boric acid into the uterus by means of compressed air. The apparatus used is simple, consisting of a quart jar, firmly corked, through which runs a long tube reaching nearly to the bottom of the jar and another shorter one that reaches slightly beyond the cork. The jar is filled with boric acid and air is forced through the long tube by means of compression. This balloons the uterus and the boric acid powder reaches all parts. This treatment is repeated daily, or every other day, until the uterus is contracted within the pelvic cavity. A pint is an average amount for a treatment, although any amount may be used safely.

In discussing Dr. Kempf's treatment, Dr. W. H. Welch stated that one must use boric acid in the uterus in order to be able to appreciate properly its great value in this condition. For more than ten years, Dr. Welch has used a capsule containing nothing but pure boric acid for this purpose and he stated that he considered that the efficiency of this drug could not be excelled. All were urged to try the method outlined by Dr. Kempf as a distinct improvement over the well-known capsule method.

Dr. J. A. Owens, of El Paso, presented the next subject, "Results of Blood-Testing All Flocks Contributing Eggs to Hatcheries for Bacillary White Diarrhea." Dr. Owens stated that, first of all, the flocks were culled by state authorities. This was followed by tests for tuberculosis and bacillary white diarrhea. These two tests took about 18 per cent of the flocks. In a number of instances, the owners desired to keep the reactors to the bacillary white diarrhea test in separate quarters, but in-

variably it was found that this procedure did not pay. In one flock of 230 birds, fifty-two were eliminated, only three of which proved to be layers. In one flock, the hatchability of the eggs jumped from 50 to 80 per cent immediately following the test. The pullorin test picked out about 10 per cent more reactors than the agglutination test, as checked at the University of Illinois.

Results on the livability of chicks showed that out of 4,097 chicks leaving the hatchery 3,684 were raised to the broiler stage. Dr. Owens believes that close to 80 per cent of the chicks from this hatchery were raised to the broiler stage. In one instance, where the initial test showed 23 per cent infection and the owner practiced no sanitation, there was trouble, showing that bacillary white diarrhea testing is but one step in the proper direction.

One of the most appreciated numbers on the program was from a former member of the Association, who had moved to Missouri a few years ago, Dr. H. A. Presler, of Hannibal, Mo., who read a paper on "Ethics." This was very highly complimented by his audience, because it contained a series of thoughts that were both instructive and constructive to the profession.

Dr. H. H. Alp, poultry extension specialist, University of Illinois, spoke on "The Results of Poultry Sanitation Work in Illinois." In no phase of animal industry does sanitation return greater dividends than in poultry-raising. Parasitisms and many epizootics can be largely prevented by sanitation, as proven on various poultry farms during the past few years.

"Rabies, Its Status in Illinois" was presented by Dr. A. C. Bolle, of the State Department of Agriculture, Springfield. Many counties at the present time are under quarantine, due to the unusual prevalence of rabies. Traffic in dogs is likewise reduced and efforts are being made to hasten the time when normal conditions will again prevail.

Our old-time friend, Dr. T. A. Sigler, of Greencastle, Ind., ex-president of the American Veterinary Medical Association, was the next on the program with the subject, "Surgery in Veterinary Practice." Surgery in the larger animals has decreased during the past few years, because of the decrease of horse practice. Late graduates are better equipped for operations on small animals and many seem to prefer administering and shy away from all but emergency surgery, which is wrong. Dr. Sigler dwelt on the importance of properly preparing patients

for operations and under no circumstances should any beneficial technic be omitted. The surgeon uncovers disease or exposes his errors. He may depend on nature in the treatment of disease, but knowledge and skill are necessities in surgery. Dr. Sigler covered such conditions and procedures as surgical exploration and treatment of traumatic pericarditis; ligating or tying off the blind pouches of the intestines of turkeys in the treatment of blackhead; volar tenotomy in colts and horses; the French operation for quittor; and so forth.

Dr. L. A. Merillat occupied the remainder of the time with a question-box.

The second day the meeting was called to order promptly at 9:00 a.m. The first number on the program was "Contagious Pyelonephritis," by Dr. H. L. Hanna, of Kinmundy, who described the disease as he had observed it in an outbreak in his locality. This proved to be intensely interesting to all present.

Dr. C. B. Hawes, of Poplar Grove, presented the subject, "Ostertagia Infestation in Cattle." This stomach worm of the ox is minute in size and has doubtless been overlooked by many. The condition, perhaps, is not so unusual as is believed. Dr. Hawes described a large herd in which both tuberculosis and Johne's disease had been suspected. Finally a postmortem revealed the presence of these parasites. Dr. Hawes worked out a treatment consisting largely of copper sulphate solution, which apparently overcame the trouble and the animals returned to normal.

"Poisonous Plants" was the theme under which Professor Albert A. Hansen, of Purdue University, Lafayette, Ind., discoursed for the enlightenment of those present. His subject has probably never been presented better than it was on this occasion. Professor Hansen covered poisoning by snake root, cockle-burr, wild cherry, Jimson weed, Dutchman's breeches, larkspur, sneeze weed, water hemlock, sweet clover, and wild barley or fox tail.

The literary part of the program was brought to a close by Dr. H. A. Wilson, state veterinarian of Missouri. His subject, "The Trend of the Times; Causes; Effects and Results," gave Dr. Wilson an opportunity to deliver one of his typical Wilsonian addresses and he did full justice to the occasion.

The social part of the program included an auto trip to the flying-field for the ladies on Thursday afternoon and a boat trip down the river at night. On this occasion, a moving picture

film was shown, illustrating the manufacture of biologics. The afternoon of the second day, the Association was the guest of the Fairmount Racing Club and all enjoyed the races. One race feature was called "The Illinois Veterinary Association Derby." An excellent paddock cover was provided by the Association for the winner of this race. The winner wore it as he rode past the grandstand, thereby giving our profession some very good publicity.

W. H. WELCH, *Secretary.*

### KANSAS CITY ASSOCIATION OF VETERINARIANS

The regular monthly meeting of the Kansas City Association of Veterinarians was held at the Baltimore Hotel, Kansas City, June 20, 1928. The program was devoted to a discussion of swine problems, directed by Dr. A. T. Kinsley, of Kansas City, and a round-table discussion on swine practice, lead by Dr. F. H. Suits, of Odessa, Mo. The meeting was attended by thirty-five veterinarians. The July meeting took the form of a picnic at Fairyland Park, the evening of July 18, 1928.

### NORTHEASTERN INDIANA VETERINARY ASSOCIATION

The annual meeting of the Northeastern Indiana Veterinary Association was held at the cottage of Dr. Roy Clark, at Tri-Lake, Ind., June 19, 1928. The meeting was the seventh that has been held at the same place and on the same day each year, to celebrate the birthday of Dr. Clark. Thirty-five were in attendance. Boating and bathing featured the entertainment. A business session was held in the afternoon.

### MARYLAND STATE VETERINARY MEDICAL ASSOCIATION

The summer meeting of the Maryland State Veterinary Medical Association was held at the University of Maryland, College Park, July 19-20, 1928, with about sixty members in attendance.

The meeting was called to order by the President, Dr. John P. Turner, of Washington, D. C. In his presidential address, Dr. Turner pointed out that many veterinarians are specializing in small-animal work, often at the expense of the less lucrative but more important large-animal practice in the country. He believes that these veterinarians should be cautioned in regard to such a

procedure, as hard times might become embarrassing, on account of many people not being able to afford to have their pets treated. Dr. Turner also condemned unethical advertising, now being employed in certain cases by men conducting small-animal hospitals. He cited several specific cases.

Mention was made of the encouragement given the profession by the increased appropriations made by Congress during the recent session. The estimate of the Bureau of the Budget was increased over \$189,000 for salaries in the Bureau of Animal Industry. This increase, together with that made available by the Welsh Bill, will raise salaries throughout the Bureau and thus indirectly affect the profession over the whole country. The salary "hump," as it has been termed, was formerly \$2400. It is now \$2800 per year. The entrance salary likewise has been increased from \$1860 to \$2000 per year. This should help to increase matriculation in our veterinary colleges. At present the number of graduates each year will hardly care for the replacements in the Bureau of Animal Industry alone. Nevertheless, Dr. Turner believes that, while officially there is a shortage of veterinarians, the law of supply and demand still obtains and, if a section will appreciate and support a veterinarian, but little trouble will be found in inducing a practitioner to locate where he can render such service.

Dr. Turner recommended the appointment of a publicity committee, for the purpose of bringing certain information to the attention of farmers in an ethical manner. Much advice on methods to be pursued in sanitation and disease prevention could be thus handled most satisfactorily.

Fitting tributes were paid to the splendid service rendered the country and the profession by two prominent veterinarians of Maryland who died the past year. They were Dr. Ernest C. Schroeder and Dr. Gustavus H. Grapp.

Dr. J. W. Hughes, of Ammendale, followed with a case report on "The Treatment of Teat Obstructions in Cattle." This report included several types of cases and was most interesting. In fact it was a most excellent paper on this subject. The use of silver nitrate in many of the cases cited was found to be helpful.

The final paper of the morning was delivered by Dr. John R. Mohler, chief of the U. S. Bureau of Animal Industry. His title was "Infectious Diseases of Live Stock." Contagious abortion and tuberculosis were discussed. This paper was so much

appreciated that it will be published in an early number of the *Cornell Veterinarian*.

The afternoon was devoted to clinics for large and small animals. Dr. D. H. Udall, of Cornell University, was in charge of the large-animal work and Dr. E. B. Dibbell, of Baltimore, conducted the small-animal clinic. Both of these were most interesting and instructive.

The banquet was held at the University Dining Hall in the evening, with sixty-five in attendance. Dr. Maurice C. Hall, of the U. S. Bureau of Animal Industry, acted as toastmaster. The members of the Association now feel that Dr. Hall is as good an after-dinner speaker as he is a scientist and that is saying a good deal. The other speakers merited their share of commendation. They included Dr. A. R. Pearson, president of the University of Maryland; Dr. H. J. Patterson, dean of the Maryland Agricultural College and director of the Maryland Experiment Station; Dr. D. H. Udall, of Cornell University; Dr. E. B. Simonds, in charge of tuberculosis eradication work in Maryland; Dr. Hulbert Young, of Walker Gordon Laboratories, Baltimore; Dr. C. M. Grubb, of Rockville; and others.

The first paper to be presented at the morning session the second day was a case report by Dr. J. B. Koerner, Jr., of Sykesville. The author described two most interesting cases. One was probably necrobacillosis of the liver in a cow and the other was a most unusual chain of periodic indigestions following foaling in a mare.

Dr. R. V. Smith, of Frederick, presented the second paper, which consisted of a series of case reports on cesarean section in the cow. Most of the cases described were not attended until late in labor and much damage had been done by the owners of the cows. Under such conditions, the cases often terminated fatally.

The third paper was presented by Dr. F. W. Miller, veterinarian at the Government Farm, Beltsville. His subject was "Abortion Disease in the Herd." Dr. Miller gave his experience with the disease at the Oregon Experiment Station and at Beltsville. At the latter farm an abortion-free and an infected herd are being maintained. This paper was most instructive. Among other things, Dr. Miller informed us that under their system of management it costs them about six and one-quarter cents more to produce a gallon of milk from the infected herd than it does from the free herd.

The last paper of the morning was delivered by Dr. D. H. Udall. His subject was "Affections of the New Born." Dr. Udall outlined a system of calf feeding which was most instructive. The paper is not reviewed here as it will be published in an early number of the *Cornell Veterinarian*.

The afternoon was devoted to large-animal clinics, conducted by Dr. W. J. Lee, of the University of Pennsylvania.

E. M. PICKENS, *Secretary*.

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### NEVADA STATE VETERINARY ASSOCIATION

The semi-annual meeting of the Nevada State Veterinary Association was held at Reno, July 20, 1928. Twelve members and two visitors were in attendance. The afternoon was devoted to a clinic, under the supervision of Dr. H. A. Reagor, at his hospital and in the field. A variety of interesting material was presented for examination and discussion.

At the evening session, the following literary program was presented:

- "Johne's Disease," Dr. L. C. Butterfield, U. S. Bureau of Animal Industry, Reno.
- "Some Phases of Dairy Practice," Dr. G. T. Woodward, Fallon.
- "Anaplasmosis of Cattle," Dr. W. H. Hilts, State Board of Stock Commissioners, Elko.
- Case reports by various members.

The papers presented brought out much interesting discussion. Dr. W. A. Montgomery, of the U. S. Bureau of Animal Industry, located at Reno, was elected to membership.

EDWARD RECORDS, *Secretary*.

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### NORTHEASTERN ILLINOIS VETERINARY MEDICAL ASSOCIATION

The regular monthly meeting of the Northeastern Illinois Veterinary Medical Association was held at the hospital of Dr. J. C. Wingert, Marengo, July 17, 1928. About thirty-five were present. Dr. B. A. Beach, of the University of Wisconsin, was the principal speaker. He gave a very interesting talk on "Poultry Diseases" and conducted a clinic on a number of diseased fowls. A picnic lunch on the lawn followed the meeting.

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The veterinarians of Clinton County (Ill.) met at DeWitt, Ill., July 27, 1928, and organized a county association. Officers were chosen as follows: President, Dr. J. H. Odgers, DeWitt; secretary-treasurer, Dr. R. S. Betts, Lost Nation.

## **NECROLOGY**

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### **PETER CHRISTOPHER JUHL**

Dr. Peter C. Juhl, of Prince Bay, Staten Island, N. Y., died April 18, 1928, following a stroke of paralysis two weeks previous.

Born at Langetved, Denmark, May 31, 1853, Dr. Juhl received his veterinary training at the Royal College of Veterinary Surgeons, Copenhagen. He was graduated in 1875, in the same class as Professor B. Bang. Many of those who attended the A. V. M. A. meeting in Philadelphia, one year ago, will recall that these two eminent veterinarians had the great pleasure of renewing their acquaintance for the first time, 52 years after they left college.

Dr. Juhl had many accomplishments to his credit, both within and without strictly professional fields.

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### **A. McMILLAN**

Dr. A. McMillan, a graduate of the Ontario Veterinary College, class of 1890, who practiced at Brandon and Oak Lake, Man., for a number of years and later at Dubuc, Sask., was killed in an automobile accident, the early part of June. While located at Brandon, Dr. McMillan was a veterinary inspector under the Animal Contagious Diseases Act.

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### **JAMES MURRAY**

Dr. James Murray, of Detroit, Mich., died July 4, 1928. He had been in poor health for some time. Dr. Murray was a graduate of the Detroit Veterinary College, class of 1896, and had practiced in Detroit for over thirty years.

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### **HOWARD WESLEY WILSON**

Dr. Howard W. Wilson, of Helena, Arkansas, died July 18, 1928, following an emergency operation for appendicitis.

Born in Chicago, Ill., March 17, 1891, Dr. Wilson attended high school and spent one year at the College of Agriculture, University of Illinois. He then entered the Chicago Veterinary College and was graduated in 1915.

Dr. Wilson practiced first at Gilman, Ill., and while located there entered the Veterinary Corps for service in the World

War. He was stationed at Camp Pike and later Fort Sill. At the close of the war he located at Helena, Ark.

Dr. Wilson joined the A. V. M. A. in 1918 and served as Resident Secretary for Arkansas from 1922 until 1926. He was active in the Arkansas Veterinary Medical Association. He was a member of the Alpha Psi Fraternity.

Surviving Dr. Wilson are his widow, a daughter, one sister and one brother.

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### JOHN ISAAC HANDLEY

Dr. John I. Handley, of Atlanta, Ga., one of the most widely known veterinarians in the southeastern states, died suddenly, July 23, 1928.

Following his graduation from the Alabama Polytechnic Institute, in 1913, Dr. Handley accepted a position at the North Carolina Agricultural and Mechanical College, West Raleigh. A short time later he went to the Michigan Agricultural College, East Lansing, to accept a teaching position in the Division of Veterinary Medicine. At the outbreak of the World War, Dr. Handley entered the Veterinary Corps and was assigned to the 41st Division, at Newport News, Va. He was ordered overseas and saw active service in France.

After the war Dr. Handley located in Atlanta and organized the Southeastern Laboratories, Inc., of which he was president. He also took a very active part in the Southeastern States Veterinary Medical Association and was serving that organization as secretary-treasurer, for the ninth term, at the time of his death. Dr. Handley was a member of the Alpha Psi Fraternity and was president of the National Council at the time of his death. He joined the A. V. M. A. in 1913 and served as Resident Secretary for Georgia, 1925-1928.

Dr. Handley was in private practice in Atlanta, having severed his connections with the Southeastern Laboratories about a year ago. He possessed considerable executive ability, was a staunch supporter of the veterinary profession in season and out, a tireless association worker, generous to a fault and the kind of a man that everybody liked. He had more than his share of troubles, but these he rarely revealed except to his most intimate friends. Peace be to his ashes.

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**FRANKLIN ADAMS**

Dr. Franklin Adams, of Paris, Ill., was found dead in the Illinois State Hospital, at Kankakee, August 4, 1928, after having been in the institution as a patient for about a week.

Born at Logan, Ill., in 1887, Dr. Adams received his education at Charleston Normal School and the Kansas City Veterinary College. Upon graduation from the latter institution in 1911, he located at Hammond, Ill., later going to Paris.

Dr. Adams joined the A. V. M. A. in 1912. He was a member of the Illinois State Veterinary Medical Association and the Alpha Psi Fraternity. He is survived by his widow, one daughter, three sisters and three brothers.

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**GLENN B. KIRKWOOD**

Dr. Glenn B. Kirkwood, of Woodside, Long Island, N. Y., died August 7, 1928, the result of an abdominal wound inflicted with a knife in the hands of his wife during a jealous quarrel.

Born at Marysville, Kansas, September 28, 1901, Dr. Kirkwood attended high school and the Kansas State Agricultural College. He was graduated in 1923 and entered private practice at Long Island City, N. Y., where he conducted a small-animal hospital.

Dr. Kirkwood joined the A. V. M. A. early this year. He was also a member of the New York State Veterinary Medical Society.

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**ALBERT E. RISHEL**

Dr. A. E. Rishel, senior veterinarian in the Bureau of Animal Industry, died on August 8, 1928, in a Paterson, N. J., hospital, while preparations were being made to perform a surgical operation for some acute intestinal trouble.

Born at Mendon, Michigan, in May, 1865, Dr. Rishel was graduated from the Chicago Veterinary College in 1889, and entered the service of the Bureau of Animal Industry in 1898, at which time he was assigned to meat inspection work at Chicago. In 1903 he resigned, in order to engage in private business, but was later reinstated and in 1904 placed in charge of the meat inspection station of the Department at Los Angeles, Calif. In 1912 he again resigned, but was reappointed in 1913 and ordered to London, England, on duties incident to the tuberculin-testing

of cattle in Great Britain prior to their shipment to the United States. Owing to a practical cessation of live stock shipments following the outbreak of the World War, he was withdrawn from the London post and placed in charge of the Bureau of Animal Industry office at the Customhouse in New York City, handling matters relating to the importation and exportation of live stock and the sanitary control of hides, skins, other animal by-products, feeding materials, etc., entering that port. In 1926 he was assigned to the Animal Quarantine Station for the port of New York, at Clifton, N. J., in addition to his other duties in New York City.

Dr. Rishel was an unusually able administrative officer, having excellent judgment and unlimited energy, combined with tact, a pleasing personality and uniform affability. His death has removed from the service of the Department a most capable and valuable officer.

Dr. Rishel joined the A. V. M. A. in 1910.

J. R. M.

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### LOUIS EDWARD GROBMAN

Dr. Louis E. Grobman, of Portsmouth, Ohio, died in the Schirrman Hospital, August 20, 1928, following two surgical operations. He was in his 48th year. Dr. Grobman was a graduate of the Ohio State University, class of 1912. For several years following his graduation he was a member of the veterinary teaching staff. He then practiced in Cleveland and located in Portsmouth about a year ago. Dr. Grobman was a 32nd degree Mason and a member of the B'Nai Brith. He is survived by his widow, four daughters, his father and four sisters.

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### PERSONALS

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#### MARRIAGES

Dr. Reimer A. Asmus (Corn. '27), of Troy, N. Y., to Miss Doris May Henry, of Ithaca, N. Y., February 14, 1928.

Dr. Alphonso Collins Newman (Corn. '27), to Miss Doris Eleanor Hammond, both of Westport, N. Y., June 1, 1928, at Westport, N. Y.

Dr. Robert G. Little (U. P. '26), of Williamsport, Pa., to Miss Helen Gertrude Fessler, of Lancaster, Pa., June 15, 1928.

Dr. Munro Sours (Mich. '25), of Tuckahoe, N. J., to Miss Margaret Danna-man, of Mays Landing, N. J., August 4, 1928, at Mays Landing, N. J.

**PERSONALS**

Dr. Lynuel O. Fish (Ind. '16) has removed from Norman Station, Ind., to Spencer, Ind.

Dr. H. Shepard (S. W. '16), of Killeen, Texas, has located at 1626 Pear St., Dallas, Texas.

Dr. M. L. Boevers (Iowa '24), formerly of Birmingham, Ala., is now located at Lanett, Ala.

Dr. L. Dale Hoag (Iowa '25) has removed from Larchwood, Iowa, to Cherokee, Iowa.

Dr. Kenneth L. Bullis (Iowa '28) has located at DeKalb, Ill. Address: 358 Augusta Ave.

Dr. C. R. Dilts (O. S. U. '04), formerly of Napoleon, Ohio, is now located at Ravenna, Ohio.

Dr. Earl H. Meyer (St. Jos. '23), formerly of Albion, Nebr., has removed to David City, Nebr.

Dr. W. B. Davidson (Ont. '18) has changed locations, going from Windthorst to Estevan, Sask.

Dr. D. R. Cook (San. Fran. '18), formerly of Bakersfield, Calif., is now at Bellevue Ranch, Merced, Calif.

Dr. N. L. McBride (Chi. '14) is a member of the staff of the North Shore Animal Hospital, at Evanston, Ill.

Dr. E. W. Rackley (U. P. '28), formerly of Waynesboro, Ga., has located for general practice at Waycross, Ga.

Dr. S. A. Schneidman (Corn. '15) recently completed a new veterinary hospital at Bellaire, Long Island, N. Y.

Dr. Elvin R. Coon (Ind. '21) has removed from Winamac, Ind., to Logansport, Ind. Address: 709 West Broadway.

Dr. Ben R. Criley (Iowa '28) has accepted a position with the Lederle Antitoxin Laboratories, at Pearl River, N. Y.

Dr. L. H. Dunn (McK. '18) has requested change of address from Newell, S. Dak., to 120 Temple Court, Calixico, Calif.

Dr. F. F. Dowd (Corn. '10) is employed by the Panama Canal Zone Health Department as veterinarian and meat inspector.

Dr. R. B. McCord (Corn. '13), of Northeast, Pa., holds the office of postmaster in addition to conducting his private practice.

Dr. J. C. Conway (T. H. '14) has removed from New Goshen, Ind., to Clinton, Ind., where he will engage in general practice.

Dr. H. T. Clarno (Chi. '18), of Farmer City, Ill., received serious injuries recently when he was kicked in the ribs by an unruly cow.

Dr. J. Hubley Schall (U. P. '28) has accepted a position at the Ellen Prince Speyer Hospital for Animals, 350 Lafayette St., New York City.

Dr. H. F. Failor (Ont. '11), of Spencerville, Ohio, has erected an up-to-date veterinary hospital on the property which he purchased recently.

Dr. R. Todd Gregory (McK. '18), formerly of Moundsville, W. Va., has removed to Newport News, Va., and is engaged in general practice there.

Dr. G. S. Harshfield (O. S. U. '16) has been transferred from Cadiz, Ohio, to Alliance, Ohio, where he is engaged in tuberculosis eradication work.

Dr. Frank H. Brown (Ind. '10) was recently re-elected State Veterinarian of Indiana for his third term by the Indiana State Live Stock Sanitary Board.

Dr. Don R. Coburn (Mich. '24) is State Animal Pathologist, with headquarters at the Bacteriology Laboratory, Michigan State College, East Lansing.

Dr. Francis Falls (U. P. '06), who has been resident surgeon at the Veterinary Hospital, University of Pennsylvania, the past year, is now located at Brookline, Pa.

Dr. H. F. Emick (McK. '01), of Indianapolis, has accepted a position with the Indiana State Live Stock Sanitary Board. His work will consist of inspection of poultry flocks for tuberculosis.

Dr. E. F. Sheffield (O. S. U. '22), formerly of Richland, Mich., is now located in Pasadena, Calif., as a field veterinarian with the California State Department of Agriculture, Division of Animal Industry.

Dr. C. J. Johnnanes (Ont. '05), of the Health of Animals Branch, Canada Department of Agriculture, was elected president of the Saskatchewan Guernsey Breeders Club at a meeting held in Saskatoon on July 27.

Dr. C. B. McGrath (Iowa '23) has resigned his position with the Nebraska Bureau of Animal Industry, and will enter private practice at Onawa, Iowa. Dr. McGrath was engaged in scabies eradication in the Nebraska sandhills region when he resigned.

Dr. E. C. McCulloch (K. S. A. C. '24), who has been associated with Dr. Robert Graham (Iowa '10), in the Department of Animal Pathology and Hygiene, University of Illinois, has accepted a position at the Alabama Polytechnic Institute, Auburn, Ala.

Dr. Reuben Gordon (Corn. '25) of Patchogue, N. Y., opened a modern small-animal hospital, on the Montauk Highway, about three-quarters of a mile from the center of the village. The architecture is of the English cottage type, with brick front and stucco sides.

Dr. W. A. Benson (Corn. '18) has been employed for the past five years as Health Officer of the city of Daytona Beach, Fla. He has charge of mosquito control, dairy, food and meat inspection and is allowed to do a small amount of private practice outside of business hours.

Dr. E. L. Kittrell (K. C. V. C. '17), of Augusta, Ark., has a horse which he wants to enter in the "Channel Swim." Dr. Kittrell reports that, during the recent flood, he had a thirty-year-old horse which got in the river and swam ten miles. The horse came out apparently no worse for the strain.

Dr. H. C. Crawford (U. P. '09), who was for a number of years associated with the late Dr. Robert W. McCully, of New York City, has removed from Jamaica to Bellrose, which is in close proximity to Belmont Park, the Thoroughbred training center and winter quarters of Long Island.

